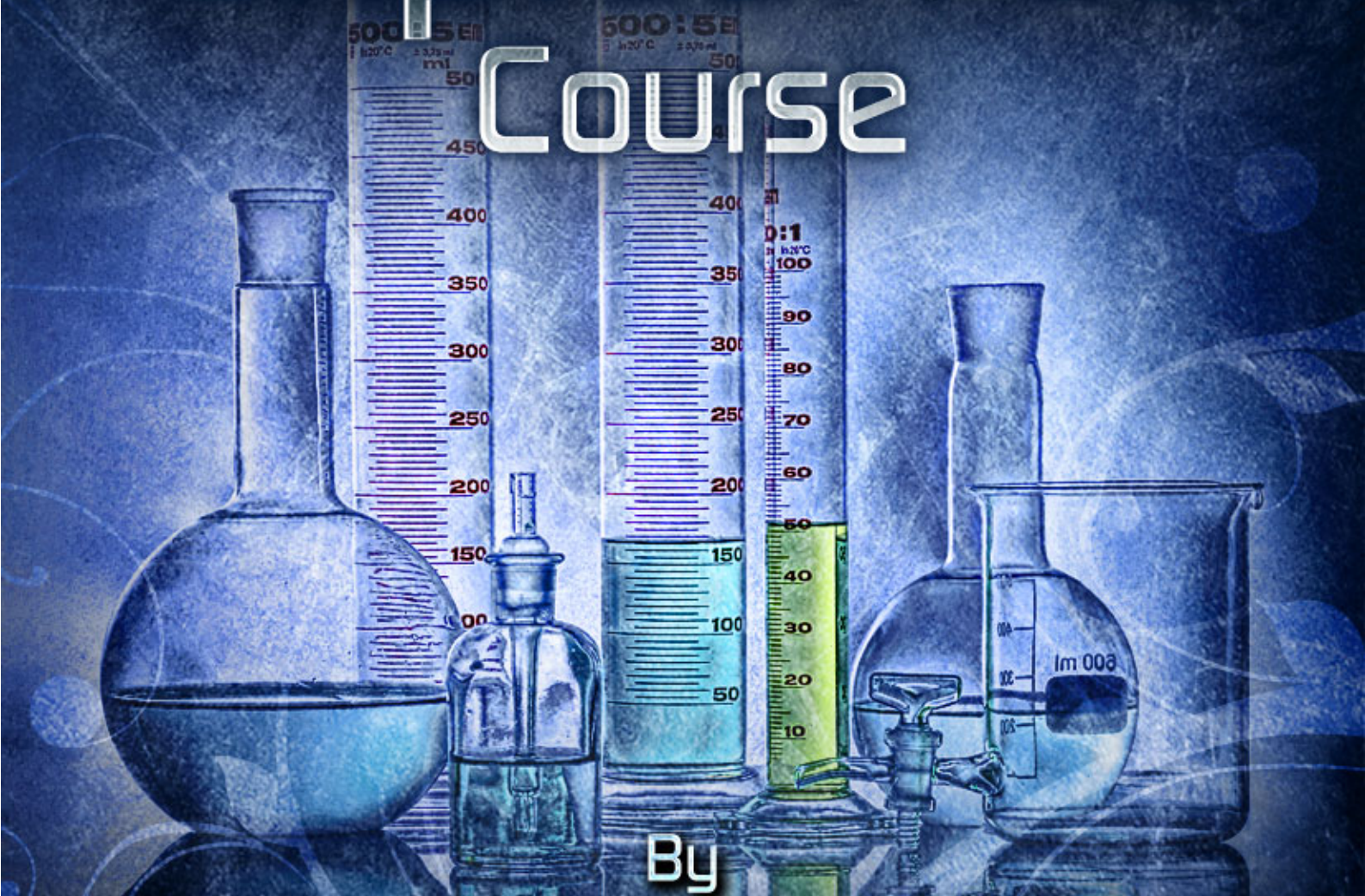
The Explosives Course



By

The Martyred Sheikh Professor

Abu Khabbab al Misri

(May Allah have Mercy upon him)

Published 1432 H

بسم الله الرحمن الرحيم

﴿وَأَعِدُّواْ لَهُم مَّا ٱسۡتَطَعۡتُم مِّن قُوَّةٖ وَمِن رِّبَاطِ ٱلۡخَيۡلِ تُرۡهِبُونَ بِهِۦ عَدُوَّ ٱللَّهِ وَعَدُوَّكُمۡ وَءَاخَرِينَ مِن دُونِهِمۡ لَا تَعۡلَمُونَهُمُ ٱللَّهُ يَعۡلَمُهُمۡۚ وَمَا تُنفِقُواْ مِن شَيۡءٖ فِي سَبِيلِ ٱللَّهِ يُوَفَّ إِلَيۡكُمۡ وَأَنتُمۡ لَا تُظۡلَمُونَ﴾

"*And make ready against them all you can of power, including steeds of war (tanks, planes, missiles, artillery) to threaten the enemy of Allah and your enemy, and others besides whom, you may not know but whom Allah does know.*"

(سورة الأنفال 60)

This book is compiled by a group of students who sat with Professor Abu Khabbab al Misry (May Allah have Mercy upon him), with his support and permission. This is the first book from a series of books aimed on this subject.

Since we compiled this book, we have aimed to standardize it to two other editions. Amongst the things we aim to detail in these editions are: (1) step by step guidance of purification of common commercial chemicals – which are available in the markets and (2) the detailed practical observations/ notes in the preparation of these explosives.

Though we have successfully performed these experiments and came up with new developments, the work of compiling these – more detailed editions of the book – are being delayed. Thus we decided to publish this work as a raw edition. And we ask Allah ta'aala to grant us *tawfeeq* for the future tasks.

This book is aimed for brothers who have a sufficient understanding of the risks in this – both the actual sensitive task of making explosives and of its security risks. It is said that in explosives "Your First Mistake Is Your Last Mistake" – and this is true for both situations.

Note: This books is released as a reference to practical Shar'ee work of Mujahideen. Hence any operation based on this book should be based upon Shar'ee approval and *maslahah* of the Mujahideen.

The publishing of this work was approved by Sheikh Ahmed Salim Swedan (May Allah have mercy upon him).

بسم الله الرحمن الرحيم

Explosives Course

This course is divided into three parts:

1. **Laboratory**
2. **Chemistry**
3. **Manufacturing**
    i. **Primary Charges**
        a. Detonators
        b. Fuses
    ii. **Main Charges**
    iii. **Launching Charge**
    iv. **High Temperature Explosives**
        a. Burning Bomb
        b. Light Bomb
        c. Smoke Bomb

Contents

PART ONE

LABORATORY

Part One

LABORATORY

Conditions Necessary For Laboratory:

1. The students should always be under the supervision of the teacher or his assistance.
2. The laboratory must be made of nonflammable material.
3. The floor of the laboratory must not be slippery.
4. In the laboratory all materials should be arranged in an organized manner. It means liquids in one place all solids in one place, Acids, Alkaline etc
5. If the laboratory is going to be used for a long term then it should be very well ventilated.
6. Electric heater; it is better to use an electric heater than direct flame.
7. Fire extinguisher either chemical or sand/water bucket
8. The following information should be written in a board as a checklist:
    a. All students should cut their nails.
    b. Do not keep body uncovered. (Specially wounds & injuries)
    c. Wear mask and gloves if needed.
    d. Body should be free of heavy thing.

Important things which should be present in laboratory:

☑ First aid kit, in It the following drugs are necessary:
- Atropine injection: Use for breathing problems.
- Cream for burns and wounds
- Sodium Carbonate [Na_2CO_3]: It is used against acids. If anyone is wounded or injured by any acid, in the injured place use sodium carbonate over the injured place. So the injury will be relived *inshā-Allāh*. After finishing experiments it is also used to neglect acidity (if sodium carbonate is poured to an acid, it will make salt and water, thus removes acidity).
- Antidote[1]

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[1] **What is antidote?**
Anti dote is a medicine use for the problems of stomach by chemicals.

How to make an antidote?
It is a mixture of 2 parts of activated charcoal + 1 part of magnesium oxide + 1 part of tannic acid.

- *Charcoal;* we can get it from anti gas medicine. Available in pharmacies (A tablet)

Advice for the teacher regarding lab and Experiments

1. Give general briefing about the lab in it the necessary rulings, safety precautions, materials arrangement...etc. and check the students do follow the rules or not.
2. Select a student to be responsible for laboratory as a lab assistant who is good academic in chemistry.
3. Before the experiments you must gather all necessary equipments needed for the experiment.
4. Store Primary charge far away from Main charge (7meter at least).Primary charge must also be away from any action which may lead to initiate it. (refer *safety precautions of primary charge*)
5. Radioactive materials should be stored in a Lead [Pb] container. Its walls must have at least 1 cm thickness. We use Lead [Pb] container because Lead [Pb] is the only material which Radiation (alpha/beta) cannot pass through.
6. Label chemicals in bottles neatly and carefully, and be sure about the name when using.
7. Keep in control the lab and trainees they should *not* to taste or smell or touch any chemical without your permission.
8. Teach the students procedure of the new experiment that you are going to start, its safety precautions, materials needed…etc; make them to write it down first. Some of the important safety tips are mentioned below
    a. Remind your student basic rulings like; to be silent, quite, patience in laboratory. And to be serious, always. And if any thing goes wrong during experiment how to act the best way to minimize the risk.
    b. Always keep your mind in touch with experiment, do not think about other things at the time of experiment like day dreams...etc.
    c. Remind to the students not to touch your nose, eyes and face or mouth or body while the experiment is going on.

- *Magnesium oxide*; get it from milk of magnesium, a white colored powder, available in pharmacies.
- *Tannic acid;* it is available in pharmacies, but it is very expensive. This can be prepared easily (as following):

How to Prepare Tannic Acid[$C_{76}H_{52}O_{46}$]?

Put some tea leaves in a beaker in a small amount of water. And boil it for 30 to 60 minutes, and it should be in brown color. Then filter it using a funnel and a filter paper. The filtrate on the flask should be taken and heated till it becomes like mud then evaporate it. It is tannic acid. Then grind all substance and mix it well. Now Anti-dote is ready.

How to use Antidote?

If any pain on stomach, by chemicals put 2 spoons of Anti-dote to half glass of Water and drink it.

   d. When you gather materials necessary for experiment keep Oxidizing Agents[2] away from Acids, flammable materials away from acids.

9. Every material arranged properly for experiment table with its purity and clean in such environment you can start your work effectively with comfortable mind.
10. If you are doing a new experiment, first, do it in front of the students as a sample, then them to try the same by using a small amount of chemicals.
11. Keep in touch with students monitor their actions while their turn is going on. Also student should inform the teacher the ongoing process.
12. After finishing the each and all experiment instruct the students to clean and return instruments to the place where it was before.

Safety Precautions When Heating

- Keep your body and hair away from the flame.
- When using gas cylinder, spark match before opening gas.
- You must be sure that the surface of equipment is dry before putting it to fire.
- Easily flammable liquids should be far away from flame.
  Eg. Acetone [C_3H_6O], Benzene (or petrol) [C_6H_6]
- You should hold the test tube using a (test tube) holder and should keep away from flame when heating.
- When heating test tube heat from top to the bottom. Do not start from bottom.
- After heating a beaker, do not keep in a cool surface. But keep in a piece of wood or paper or cloth. If you keep in a cold place it may break.
- Do not use gloves to catch hot objects.

Safety For Flammable and Fast Vaporizing Substances:

Substances which are highly flammable (liquids) like; Acetone [C_3H_6O], Benzene (petrol), and Ammonium Hydroxide [NH_4OH].

i. Keep away from fire and keep the place very well ventilated.
ii. Keep the bottles closed tightly or they will evaporate and you must cool down bottles before opening. Try to work in cold temperatures, and if any of these substances catch fire cover them with something.
iii. If you have to boil any of these substances then put small pieces of glass into them, so that they will control the boiling process and therefore will not blast. Refrain from smelling these substances and pouring of them onto the skin.

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[2] Oxidizing Agent: See p.60

iv. Some of the primary charge like Tri and Di acetone peroxide produces an explosive gas due to high temperature and long time in shelf. Always when you open it try to open in open area far away from any action, which may initiate this explosive gas in to hazard bomb.

Safety for Glasses

- Before using you must be sure that it is not broken.
- If you take a bottle do not catch at neck only, but catch at the neck and bottom.

Safety for Mercury[Hg]

- Do not touch Mercury [Hg] by hand, it may cause cancer to your body after few years.
- If Mercury [Hg] is dropped over the floor be sure to collect all of it. And should clean the floor with Nitric Acid [HNO_3]. If not, Mercury [Hg] evaporates and makes the place a danger to health. If clean with Nitric Acid [HNO_3] there will be no danger.
- If you are storing Mercury [Hg] in a bottle, pour Water over it, this prevents evaporation of it. The ratio = 3 Water :1 Mercury

Safety For Acids And Alkaline

***Following are Safety Precautions for Both Acids and Alkaline**:*

i. If you use a little amount, use a dropper. And for large amount use a graduated cylinder.
ii. If you add acid or alkaline to water, you can add acid to water first but not water to acid. Because if water is added to acid, all the molecules of acid will fight to get the water molecules, causing a vigorous reaction. And this may cause braking of your container. When adding acids and alkaline pour to the wall of container. Not middle of it.
iii. Do not use metal or rubber or wood with concentrated acids or alkaline. Use glass materials. In large factories they use stainless steel instruments. Because it does not react with acid or alkaline. And using glass is difficult in factories.
iv. Do not touch concentrated acids or alkaline with hand, if a drop touches your body use Sodium Carbonate solution [Na_2CO_3].
v. All acids are fatal when it is concentrated. So don't inhale the gas nor touch with bare hand.
vi. All acids should be stored in dark glass bottles. Because it often react with some metals and produces hydrogen gas.
vii. Acids can be easily recognized by ph paper and if you pour it on dry mud vigorously react with it leaving smoke.

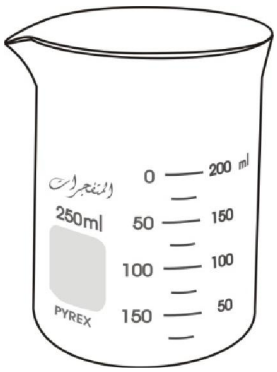
pH Paper

P(otential of) H(ydrogen) [pH]: It is an indicator used to indicate the acidity or alkalinity of a substance. It has a scale from 1 to 14 (pH scale).If it indicates 1 to 6 it is an acid. Acidity increases from 6 to 1 (i.e. if it indicates 1 it is a very powerful acid, and if it indicates 6 it is less powerful acid). pH number 7 denotes neutral. And if it indicates 8 to 14 then it is an alkaline. Alkalinity increases from 8 to 14 (i.e. 14 is a powerful alkaline, and 8 is much weaker).

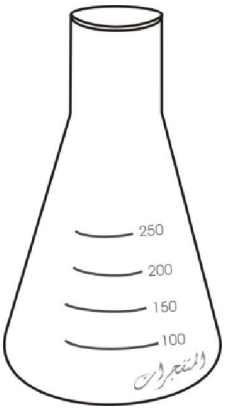
Some Instruments Used In This Course

Mortar and Pestle – use to grind materials.

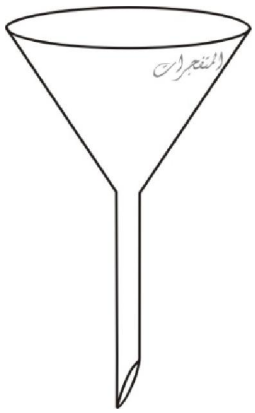
Beaker – use to mix liquids, for measuring and for making solution.



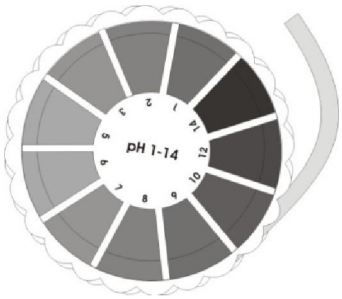
Erlenmeyer Flask – used to collect filtrate.



Funnel – use in filtration.



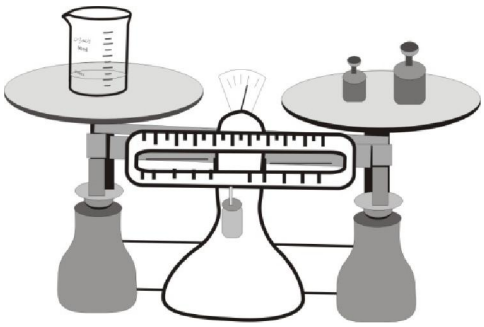
pHPaper – use to indicate acidity or alkalinity.



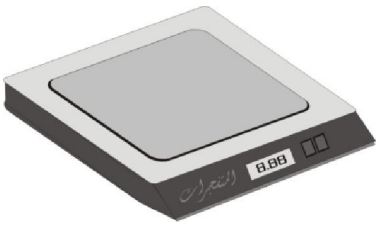
Dropper – use to take liquids in small amount and to pour drop by drop.

Watch Glass

Table Balance – use to weight object

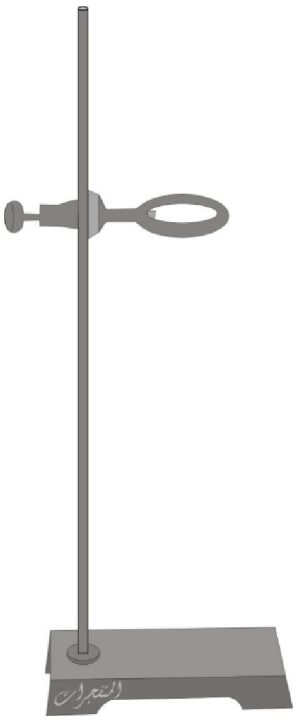


Electronic Balance – use to weight object.



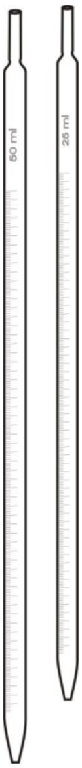
Electric Burner – use to heat by electricity.

Stand and Iron Ring – use to hold funnel by iron ring and flask in stand in filtration.

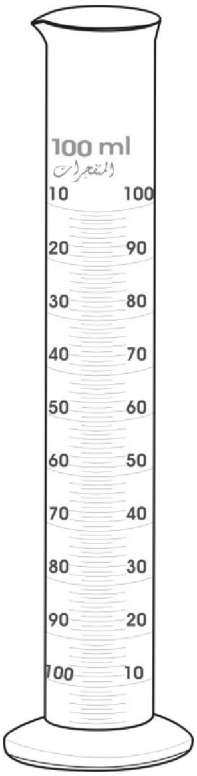


Thermo Meter - use to measure temperature.

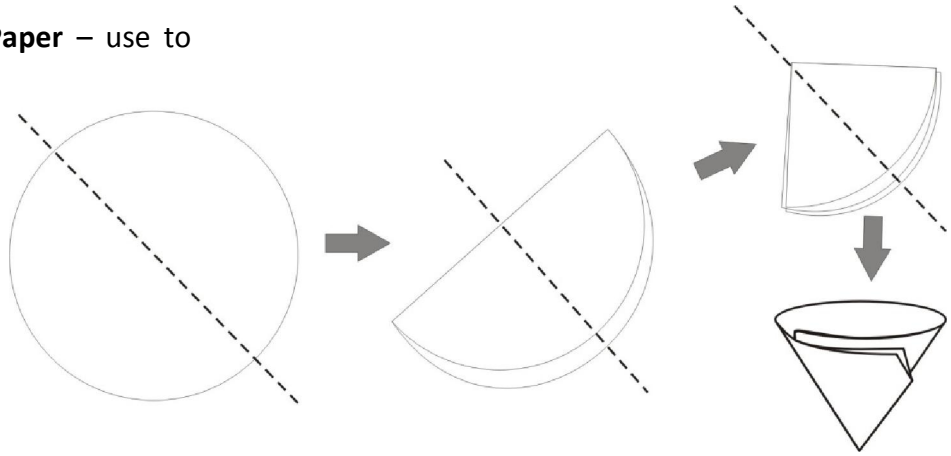
Pipette – used to take liquids in small amount.



Graduated Cylinder – use to measure liquids in large amount.



Filter Paper – use to filter.



Materials Used In This Course

Name Of Elements	Symbol	Available In / Details
Hydrogen Peroxide	H_2O_2	In medical store[3]. A viscous liquid with strong oxidizing properties; a powerful bleaching agent; also used as a disinfectant and (in strong concentrations) as an oxidant in rocket fuels
Acetone	C_3H_6O	Nail polish remover. A highly inflammable liquid ketone widely used as an organic solvent and as material for making plastics.
Mercury	Hg	In dental clinic. A heavy silvery toxic univalent and bivalent metallic element; the only metal that is liquid at ordinary temperatures, commonly used in Thermometers. Also known as quicksilver
Ethyl Alcohol	C_2H_5OH	In medical store. The intoxicating agent in fermented and distilled liquors; used pure or denatured as a solvent or in medicines and colognes and cleaning solutions and rocket fuel. Also known as ethanol, fermentation alcohol or grain alcohol.
Methyl Alcohol	CH_3OH	A light volatile flammable poisonous liquid alcohol; used as an antifreeze and solvent and fuel and as a denaturant for ethyl alcohol. Also known as Methanol, wood spirit or wood alcohol.
Hexamine	$C_6H_{12}N_4$	Can be extracted from *white coal* which is available in super markets.[4] White coal is used for burning.

[3] To *How to find the concentration of Hydrogen Peroxide [H_2O_2]*: see footnote #11

[4] **How to extract *Hexamine* from *White Coal***

1) Grind white coal
2) Stir in warm water. White coal consists of wax and Hexamine.
3) Hexamine will dissolve in water but wax will not dissolve so filter the water and the water past from filter paper consist of Hexamine.
4) Heat the water till it become like mud.
5) Keep in sunlight to dry after drying it will be very pure Hexamine.

Sodium Azide	NaN_3	In medical store
Sodium Nitrate	$NaNO_3$	In agriculture shops. Also known as soda niter
Ammonium Nitrate	NH_4NO_3	In agriculture shops
Potassium Nitrate	KNO_3	In agriculture shops. Also known as niter/nitre and saltpeter/saltpetre
Lead Nitrate	$Pb(NO_3)_2$	In agriculture shops
Barium Nitrate	$Ba(NO_3)_2$	In agriculture shops
Urea	$CO(NH_2)_2$	In agriculture shops. Also known as carbamide
Sodium Carbonate	Na_2CO_3	In super markets. A sodium salt of carbonic acid; used in making soap powders and glass and paper. Also known as sal soda, washing soda and soda ash.
Sodium Bicarbonate	$NaHCO_3$	In super markets. A white soluble compound used in effervescent drinks and in baking powders and as an antacid. Also known as baking soda, bicarbonate of soda and saleratus
Ammonium Hydroxide	NH_4OH	In super markets. It maybe also called Ammonia water.
Potassium Chlorate	$KClO_3$	In super markets. A white salt used in matches, fireworks, and explosives; also used as a disinfectant and bleaching agent.
Sodium Chlorate	$NaClO_3$	In super markets. A colorless salt used as a weed killer and an antiseptic.
Sulphuric Acid	H_2SO_4	Used for filling car batteries (battery acid). Also known as vitriol or oil of vitriol
Nitric Acid	HNO_3	In gold shops (gold smiths). May be also known as aqua fortis
Aluminium Powder	Al	In painting shop
Sulphur	S	In agriculture shops
Citric Acid	$C_6H_8O_7$	In super markets. A weak water-soluble acid found in many fruits (especially citrus fruits); used as a flavoring agent.
Acetic Acid	CH_3COOH	In super markets. A colorless pungent liquid widely used in manufacturing plastics and pharmaceuticals
Potassium Permanganate	$KMnO_4$	For cleaning water. A poisonous salt that forms dark purple crystals and is purple-red when dissolved in water;

		used as an oxidizing and bleaching agent and as a disinfectant and antiseptic. Also known as permanganate of potash.
Nitro Benzene	$C_6H_5NO_2$	For cleaning screen. An oily toxic water-soluble liquid used as a solvent and in the manufacture of aniline
Glycerin	$C_3H_5(OH)_3$	In medical store
Vaseline (Petroleum Jelly)	$C_{12}H_{32}$	In medical store. A semisolid mixture of hydrocarbons obtained from petroleum; used in medicinal ointment and for lubrication. The most commonly found commercial name of it is Vaseline, thus in the course we use this name.
Charcoal	C_2H_6O	This is the remaining of burning wood
Hydrazine Hydrate	N_2H_5OH	For making form (sponge)
Wood Powder	$C_6H_{10}O_5$	In carpentry
Soap	$C_{17}H_{35}COONa$	In super markets
Wax	$CH_3(CH_2)_{14}C(CH_2)_{29}\ CH_3$	In super markets
Sugar	$C_{12}H_{22}O_{11}$	In super markets
Zinc Powder	Zn	In coloring metal (especially of Iron or steel). It is a bluish-white lustrous metallic element; brittle at ordinary temperatures but malleable when heated; used in a wide variety of alloys and in galvanizing iron
Magnesium Powder	Mg	For making body of airplane. A light silver-white ductile bivalent metallic element; in pure form it burns with brilliant white flame

Important Acid Used in This Course

1. Sulphuric Acid [H_2SO_4]
2. Nitric Acid [HNO_3]
3. Hydrochloric Acid [HCl]

Preparation of Sulphuric Acid [H_2SO_4]

You can get Sulphuric Acid [H_2SO_4] from car batteries or chemical stores. Remember that the Sulphuric Acid [H_2SO_4] found in the car batteries has a density of 1.12g/cm^3 but the density we need for mixture is 1.84g/cm^3. So to make it denser (thicker) is to boil it till it becomes the required density. To find the density of a substance use:

$$\textit{Density} = \frac{\textit{Mass}}{\textit{Volume}} \quad \begin{matrix}\text{(You get this by weighing the mass)} \\ \text{(You get this by using a graduated cylinder)}\end{matrix}$$

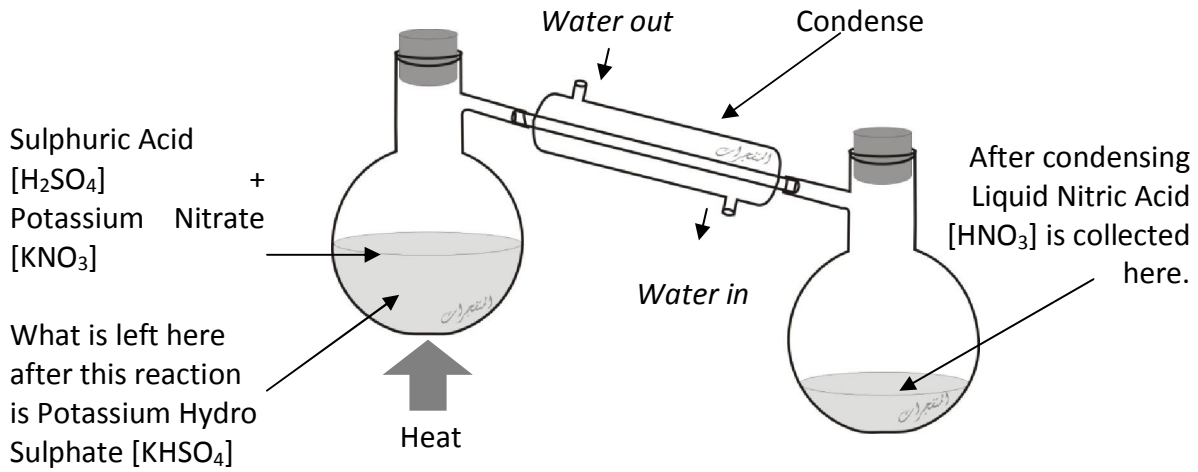
To find out the purity of a substance you boil it, and if it boils at its standard boiling point then it is the real McCoy (Boiling point is the temperature at which the substance starts to boil and vaporize. Each substance has its own fixed boiling point. For example boiling point of Sulphuric Acid is 340^{o}C). Keep in mind that whenever a substance is not denser or pure enough then you have to boil it in order to make it denser.

Preparation of Nitric Acid [HNO_3]

To make Nitric Acid [HNO_3] you mix Sulphuric Acid [H_2SO_4] with any Nitrate, so we are going to mix Sulphuric Acid [H_2SO_4] with Potassium Nitrate [KNO_3] (which is available in agricultural shops). The chemical equation for this process is:

Sulphuric Acid + Potassium Nitrate ⟶ Nitric Acid + Potassium Hydro Sulphate

This is denoted in chemical formulae as: $H_2SO_4 + KNO_3 \longrightarrow HNO_3 + KHSO_4$



You do this process by using the condensation process. You boil Sulphuric Acid [H_2SO_4] with Potassium Nitrate [KNO_3] in a round-bottom flask and then the reaction takes place and Nitric Acid [HNO_3] vapour rises, and passes through a condenser which has cold water running through it, this cools the vapour and condense them into liquid form. This liquid Nitric Acid [HNO_3] is collected in a separate flask at the other end of the condenser.

What is left behind in the flask where Sulphuric Acid [H_2SO_4] and Potassium Nitrate [KNO_3] boiled is Potassium Hydro Sulphate [$KHSO_4$].

This whole process must be carried out in a well ventilated room so that the gas doesn't harm you.

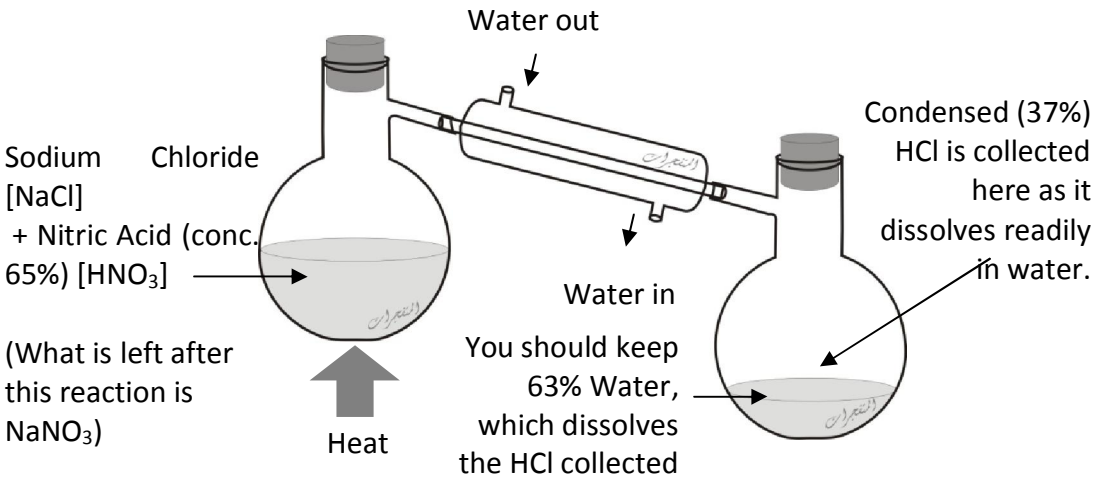
Preparation of Hydrochloric Acid [HCl]

Nitric Acid [HNO_3] reacts with any chloride to form Hydrochloric Acid [HCl]. So we will use Sodium Chloride [NaCl] (table salt):

Nitric Acid + Sodium Chloride ⟶ Hydrochloric Acid + Sodium Nitrate

HNO_3 + NaCl ⟶ HCl + $NaNO_3$

Put Sodium Chloride [NaCl] to a round-bottom flask and put Nitric Acid [HNO_3] (conc. 65%) to it. Heating will emit Hydrochloric Acid [HCl](gas). The gas is condensed using a condenser and collected in another flask.



PART TWO

CHEMISTRY

Part Two

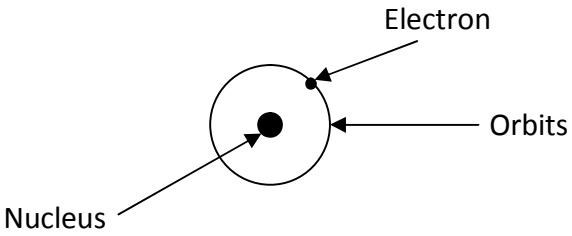
CHEMISTRY

Atoms:

Every element is made up of small parts which are called atoms. An atom consists of a "nucleus" at its center, and "electrons" revolving around it (the path which the electrons move is known as orbits).

Example:

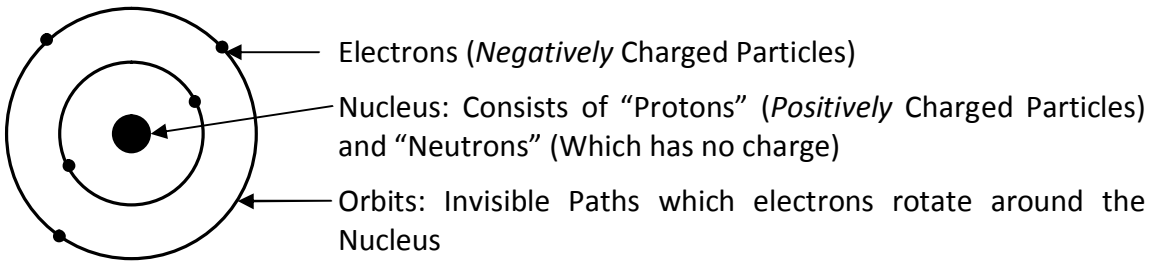
Hydrogen Atom



The Nucleus is made up of "protons" and "neutrons".

Electrons are *negatively* charged particles, where as the Protons are *positively* charged particles. The *Neutrons* does not carry any charge.

Boron Atom



Atomic Number: Each Atom have a specific number of protons, thus this number is used to denote different types of Atoms. Eg. Atomic Number of Oxygen is 8, whereas the Atomic Number of Hydrogen is 1.

Periodic Table: The "Periodic Table" is a tabular arrangement of Atom according to the Atomic Number. There are many varieties of Periodic Tables, (easily available) which you can refer. They may include Density, Mass and other details of the atoms. Also in its native

form (i.e. without joining another atom), the number of protons [+ve] (or Atomic Number)in an atom is the same as the number of electrons [-ve] in it.

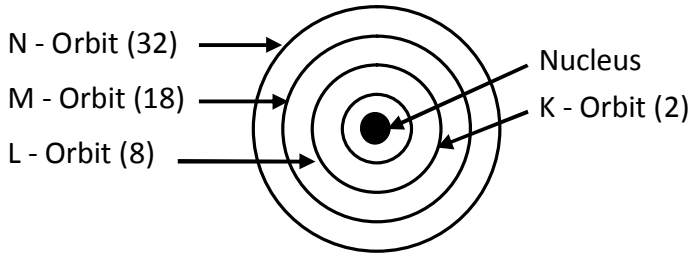
Mass of an Atom is the average mass of an atom in natural sample of an atom. The mass of the electrons are very light; hence it is neglected from this. You can easily refer to any Periodic Table to find the mass of a specific Atom.

Elements: Everything which is around us is made of elements. Elements are substance that are composed of only one type of atom. E.g: Oxygen gas, made up of oxygen molecules [O_2] and Copper Metal is made up of Copper [Cu] atoms.

Compound: Two or more elements join to form a compound. E.g: Copper Oxide is made up of Copper and Oxygen [CuO] Likewise Water is made up of Oxygen and Hydrogen. [H_2O]

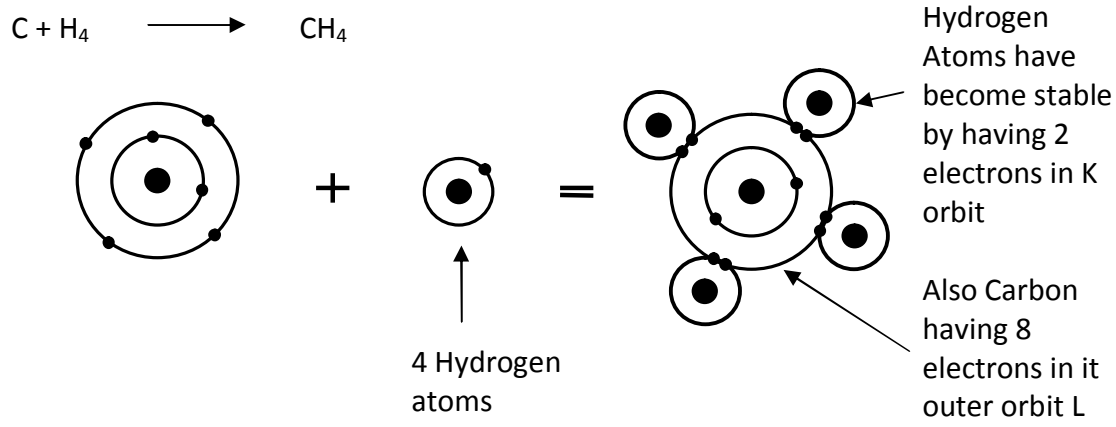
Number Of Electrons Carried In Each Orbit: In the atoms there are orbits which electrons (negative charge) rotate around the Nucleus:

- The first orbit (which is closest to the nucleus) is called the K Orbit. It can only contain a maximum number of 2 electrons.
- The second orbit or the "L Orbit" can have a maximum number of 8 electrons.
- The third or the "M Orbit" can have a maximum of 18 electrons.
- The fourth or the "N Orbit" can have a maximum of 32 electrons.



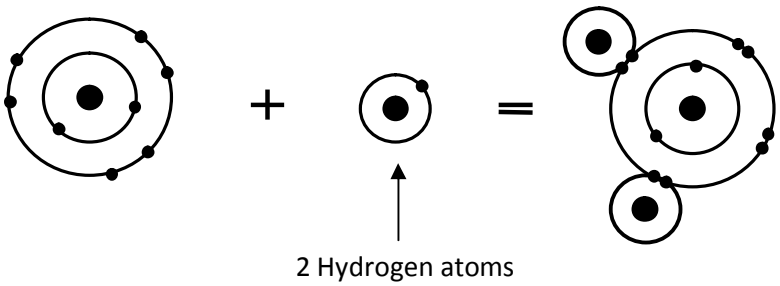
Octer Rule: If the number of electrons for last orbit of any elements or compound is for (k=2, L=8, M=18 orN=32), then it will be stable. An unstable Atom *needs* to be stable by uniting with other atoms to reach the number. This is known as chemical reactions.

Example 1:



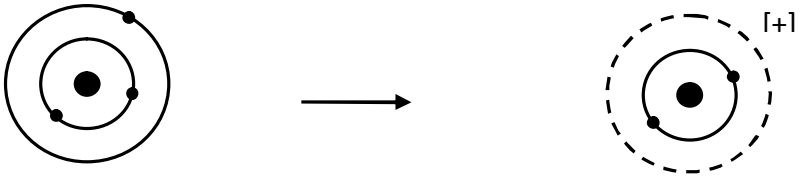
Example 2:

O^{8}_{16} +2H ⟶ H_2O



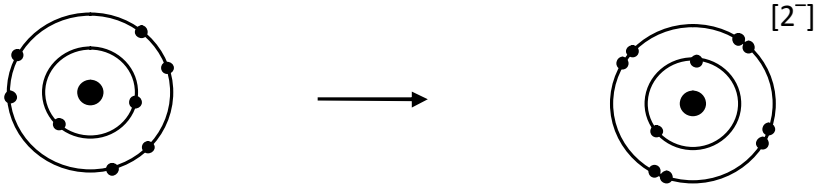
Ions: An "ion" is an atom after gaining or losing one or more electrons.

Example 1: Lithium Atom [Li^{3}_{7}]



It removes one electron from its outer most shell

Example 2: Oxygen atom [O_2]



It gains two electrons to its outer most shell

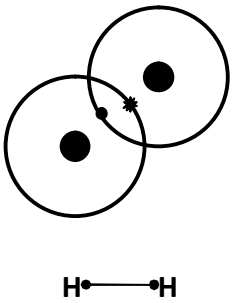
Types Of Bonds: Similar or different atoms join each other by "bonding". There are two types of bonds:

a. Covalent Bonds
b. Ionic Bonds
c. Metallic bonds (Bonds in all metals)

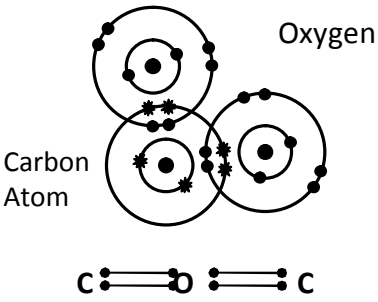
Covalent bond: An inter-atomic attraction resulting from sharing of electrons between the atoms.

Example:

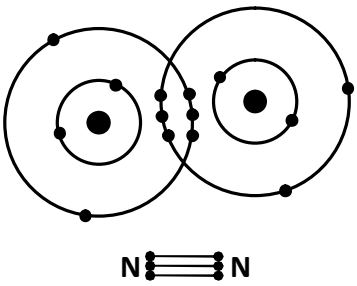
Single bond [H_2]



Double bond [CO_2]

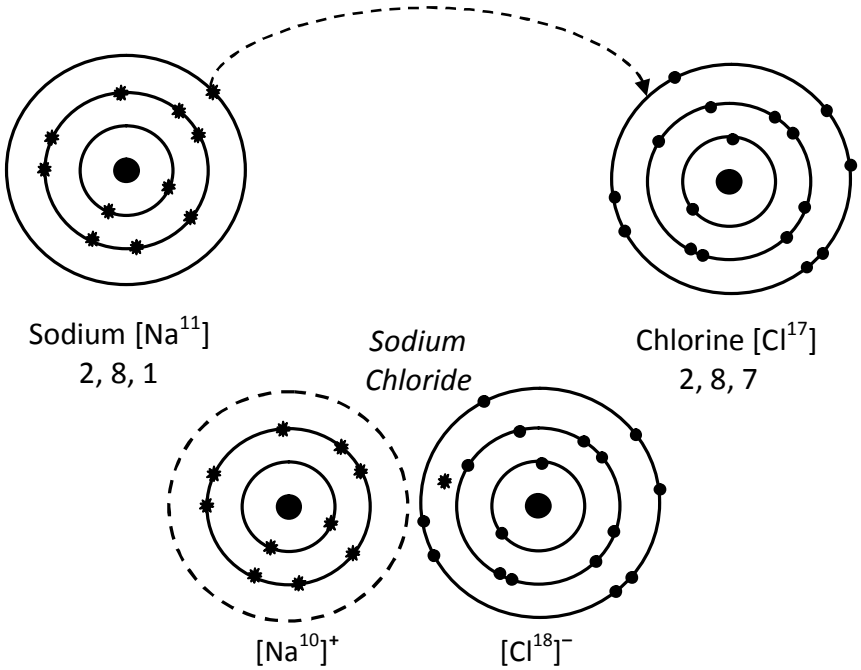


Tripple bond [N_2]



Ionic bond*:* The attraction of both positive and a negative iron resulting from a complete (or nearly complete) transfer of one or more electrons from one atom to another is known to be an Ionic bond.

Example: Formation of Sodium Chloride:



How To Name The Elements And Compounds?

Name of elements	Symbol	Notes
Hydrogen	H	First letter
Carbon	C	First letter
Calcium	Ca	First and second letter
Helium	He	First and second letter
Magnesium	Mg	First and third letter
Iron	Fe	Taken from Latin language
Sodium	Na	Taken from Latin language
Gold	Au	Taken from Latin language

Naming Compounds

Naming ionic compound is connecting name of cation (positively charged ions) and anion (negatively charged ion) – as discussed below:

i. Naming Cation

All positive ions – which form only one cation is named after its name. Example:

K^+: potassium ion
Na^+ : Sodium ion

For naming transit-ion metals cat-ion, it has two ruling:

I. Older naming system for metal ions uses the ending *–ous* for ion of lower change and *–ic* for the ion of higher change. Example:

(Fe^{2+}) : Ferrous
(Fe^{3+}) : Ferric

II. Charge of an ion is commonly indicated by a Roman numeral in bracket immediately following the ions name. Example:

(Fe^{2+}) : Iron (II) ion
(Fe^{3+}) : Iron (III) ion

ii. Naming negative ions;

Two types of negative ions are considered: Mono atomic (those having only one atom) and Poly atomic (those having several atoms)

I. A mono-atomic negative ion is named by adding *–ide* to the stem of the name of the non metal element from which the ion is derived. Example:

(Cl^-) : Chloride
(I^-) : Iodide

II. Poly-atomic negative ions are common especially the containing oxygen (*called oxo-an-ions*). Although most of these names must simply be named, some guide lines can help.

The oxo-an-ion having the greater number of oxygen atoms are given suffix *–ate,* and the oxo-an-ions having smaller number of oxygen atom has the suffix *–ite* eg; NO^-_3 is nitrate ion and NO^-_2 is nitrite ion. For a series of oxo-an-ion having more than two numbers, the ion with largest number of oxygen has prefix *per-* and suffix *–ate*. The ions having smaller number of oxygen has prefix *hypo-* and suffix *–ite.*

Some of the examples are mentioned below:

ClO_4^- → *PerChlorate* ion
ClO_3^- → *Chlorate* ion
ClO_2^- → *Chlorite* ion
ClO^- → *hypochlorite* ion

Oxo-an ion that contain hydrogen are named by adding the world 'Hydrogen' before the name of oxo an ion. If two hydrogen are in the compound, we say dihydrogen. Many of these hydrogen-containing oxoanions have common names that are often used.

Naming Ionic Compounds:

Name of ionic compound is built from the name of positive and negative ions in the compound. The name of positive ion is given first, followed by name of the negative ion.

Symbol	Positive Ion	Negative Ion	Name of the Compound
NaCl	Na^+ (sodium ion)	Cl^- (chloride ion)	sodium chloride
$KClO_3$	K^+ (potassium ion)	ClO_3^- (chlorate ion)	potassium chlorate
Fe_2O_3	Fe_3+ (iron (III) ion, also known as "ferric")	O_2^- (oxide ion)	iron (III) oxide (ferric oxide)

Balancing Equations

An Easy way to balance combusting reaction:

Using the formula to find oxidizing or reducing agent, Find how much oxygen is available from oxidizing agent and how much oxygen is needed for reducing agent.

This formula is:

[2 x No. Carbon] + [1/2 x no. of Hydrogen] : [No. of Oxygen]

For example in the reaction of [ammonium nitrate] + [acetone]

NH_4NO_3 (ammonium nitrate) + C_3H_6O (acetone)

The raw equation for this is:

$NH_4NO_3 + C_3H_6O \rightarrow CO_2 + N_2 + H_2O$

Now how to balance this:

Step #1:

In NH_4NO_3there are:

0 no. of C
4 no. of H
3 no. of O

So when we apply the formula

[2 x No. Carbon] + [1/2 x no. of Hydrogen] : [No. of Oxygen]

[2 x 0] + [1/2 x 4] : [3]

[0] + [2] : [3]

2 : 3

Therefore

2<3

(i.e. oxygen ratio is more)

3 - 2 = 1

Hence NH_4NO_3 gives an extra O

Step #2:

In C_3H_6O there are:

3 no. of C
6 no. of H
1 no. of O

So when we apply the formula

[2 x No. Carbon] + [1/2 x no. of Hydrogen] : [No. of Oxygen]

[2 x 3] + [1/2 x 6] : [1]

[6] + [3] : [1]

9 : 1

Therefore

9 > 1

(i.e. Oxygen is less)

9 - 1 = 8

Therefore C_3H_6O "needs" 8 more oxygen

Step #3:

From our previous conclusions:

- NH_4NO_3 gives an extra O [i.e. 1 Oxygen is "available"]
- C_3H_6O needs 8 more oxygen [i.e. 8 Oxygen is "needed"]

Write the equation and write the "needed number of oxygen" in NH_4NO_3 and "available oxygen" in C_3H_6O, as shown below:

[Needed Oxygen]NH_4NO_3 + [Available Oxygen]C_3H_6O → $CO_2 + N_2 + H_2O$

[8]NH_4NO_3 + [1]C_3H_6O → $CO_2 + N_2 + H_2O$

Hence:

$8NH_4NO_3 + C_3H_6O$ → $CO_2 + N_2 + H_2O$

Therefore for the first part of the equation [$8NH_4NO_3 + C_3H_6O$]

Total no. of N = [8 x 1] + [8 x 1] = [16]
Total no. of H = [8 x 4] + [6] = [38]
Total no. of O = [8 x 3] + [1] = [25]
Total no. of C = [3 x 1] = [3]

Now balance the [carbons][hydrogen] and [nitrogen]for the second part of the equation [$CO_2 + N_2 + H_2O$]

$8NH_4NO_3 + C_3H_6O$ → $CO_2 + N_2 + H_2O$

$8NH_4NO_3 + C_3H_6O$ → $3CO_2 + 8N_2 + 19H_2O$

So for the second part [$3CO_2 + 8N_2 + 19H_2O$]

Total no. of N = [8 x 2] = [16]
Total no. of H = [19 x 2] = [38]
Total no. of O = [3 x 2] + [19 x 1] = [25]
Total no. of C = [3 x 1] = [3]

Now if we calculate the total for both parts:

$8NH_4NO_3 + C_3H_6O$ → $3CO_2 + 8N_2 + 19H_2O$

16(N) + 25(O) + 38(H) + 3(C) → 3(C) + 16(N) + 38(H) + 25(O)

82 → 82

Advantage of this method:

You do not have to balance by yourself the first part of the equation (i.e. reactants). Instead you could calculate it first and then, only the second part is to be balanced.

Now, use step to find mass ratio. But, you must remember this is only theory. Practical (experimental) answer maybe different as a result of some impurities, human error, or other side reactions.

Note: when you consider oxidizing agents, available oxygen, you must think about the oxidizing compound itself. For example, KNO_3, if you find from the formula, it gives three oxygen but in reality it gives 2.5 as K (potassium) also forms its stable form of oxide, K_2O.

Another example of balancing equation:

$NH_4NO_3 + C_6H_{12}O_6 \rightarrow CO_2 + N_2 + H_2O$

Formula:
[2 x No. Carbon] + [1/2 x no. of Hydrogen] : [No. of Oxygen]

For NH_4NO_3

[2 x 0] + [1/2 x 4] : [3]

2<3

Therefore, NH_4NO_3 gives an extra Oxygen

(Note that NH_4NO_3 always gives an extra one Oxygen! i.e. it donates one oxygen)

Now for $C_6H_{12}O$

[2 x No. Carbon] + [1/2 x no. of Hydrogen] : [No. of Oxygen]

12 + 6 : 6

18>6

18 - 6 = 8

Therefore $C_6H_{12}O_6$ needs 12 more oxygen

Balanced equation for this is:

$12NH_4NO_3 + C_6H_{12}O_6 \rightarrow 6CO_2 + 12N_2 + 30H_2O$
126 (left) → 126 (right) (126 is the number of moles of atoms on each side of the equation)

Notes:

When the compound finishes with **ide**, it means it consists of two elements. Like Potassium Chloride [NaCl] or Magnesium Oxide [MgO] etc. But some are special which does not fit to this theory, like the Hydroxide group. Like Sodium Hydroxide [NaOH] etc.

When the compound finishes with **ate** it means it has 3 or 4 oxygen. Example:

Potassium Chlorate [$KClO_3$]
Sodium Sulphate [Na_2SO_4].

If it ends with **ite** it means 3 oxygen. Example:

[Na_2SO_3] : Sodium Sulphite

If **per** is present it means it is having more oxygen. Example:

Hydrogen peroxide [H_2O_2]

If a compound has **Thio** it means it is having Sulphur. Example:

[$Na_2S_2O_3$] : Sodium Thio-sulphate
[Na_2SO_4] : Sodium Sulphate

PART THREE

MANUFACTURING EXPLOSIVES

Part Three

MANUFACTURING EXPLOSIVES

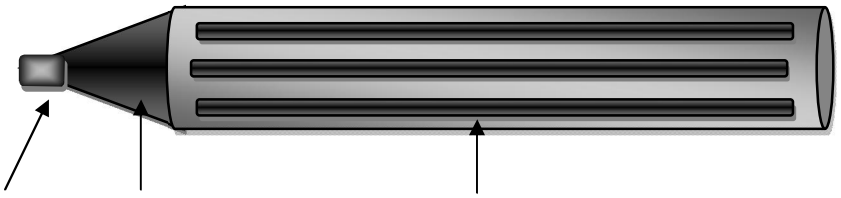
Definitions of explosives; it is a compound or a chemical mixture which can change to a lot quantity of gases in a very short time producing mechanical destruction and very high temperature.

**One volume of compound after explosion becomes 15000 volumes with in a time of 1/10,000 of a second. And temperature 3000 to 4000 °C*

Types Of Explosive

Sensitive	**Semi Sensitive**	**Insensitive (lazy)**
Primary Charges	RDX, Tetryl, Potassium Chlorate Mixtures, Hydrogen Peroxide Mixtures, Potassium, Nitrate Mixtures with Aluminium Powder	TNT, Nitrates without Aluminium

Types Of Explosive According to Usage

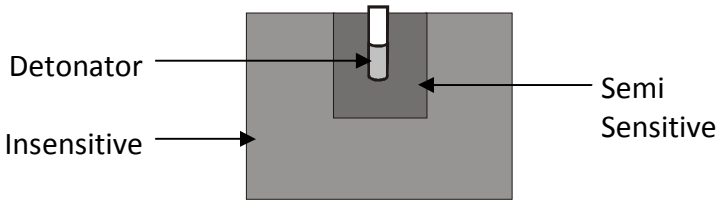


i. Primary Charge **ii. Main Charge** **iii. Launching Charge**

How A Blast Should Be

First we have to blast Primary Charge, which is very sensitive and easy to blast. By blasting Primary Charge we have to blast a Semi-Sensitive explosive and it will blast Insensitive. Without using Semi Sensitive explosive it is difficult to blast Insensitive Explosive.

Sensitive → Semi Sensitive → Insensitive



PART THREE: Section One

i. MANUFACTURE OF PRIMARY CHARGE

i. PRIMARY CHARGES

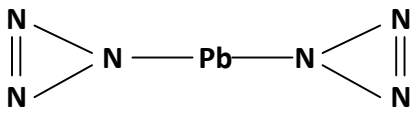
Difference between Primary and Main Charges:

1. Primary charges are very sensitive, by firing or impacting it will blast. But main charges are not sensitive.
2. In Primary charge, some of its molecules are in linear shape; due to this it is very unstable.

   Example: Shape of Mercury Fulminate[$Hg(CNO)_2$]

3. In Primary charge, some of its molecules have angle shape. Due to this it is unstable.

   Example: Shape of Lead Azide [PbN_6]



4. Majority of primary charge molecules carry a heavy metal in middle of it. Any effect by fire or impact, these molecules discharges the heavy metal particles, so it changes to small balls with extreme temperature. This makes the wave of the blast.

Main Primary Charges:

1. Lead Azide [PbN_6]
2. Mercury Fulminate [$Hg(CNO)_2$]
3. Acetone Peroxide
   - Dicyclo Acetone Peroxide [$C_6H_{12}O_4$]
   - Tricyclo Acetone Peroxide [$C_9H_{18}O_6$]
4. Hexamine Peroxide [$C_6H_{12}O_6N_2$]

1. LEAD AZIDE [PbN_6]

Properties

1. It is in the form of white colored crystals
2. The temperature at which it blast is 380°C
3. Speed of blast is 5300 m/s
4. Its density is 4.8 g/cm3
5. When the explosive is placed with small stones it increases its sensitivity tremendously. Due to this we prevent you from making impact bombs from Lead Azide.[5]
6. It dissolves in compounds of Sodium and Ammonia i.e., Sodium Acetate [CH_3COONa] and Ammonium Acetate [CH_3COONH_4]. Dose not dissolve In water.
7. It is not affected a lot by humidity even if it is in a mixture of 50% water it still blast.
8. It is affected by light, the longer it stays in light the weaker it becomes.
9. Storage should be under water in the ratio is 3:1, water is 3, Lead Azide is 1.
10. Do not place it in Copper [Cu]; it will react with Copper to form Copper Azide which is very sensitive. But if Lead Azide is kept in water with Copper this is not a danger nevertheless after water dries out then it becomes extremely sensitive.
11. How to *denature* it:
    a. Place it in sunlight
    b. Boil it with water for a long time and it should go dead or finished
    c. Allow to absorb concentrated solution of Sodium Acetate [CH_3COONa]
    d. Put in Acetic Acid [$C_2H_4O_2$]
12. With 50% of moisture it may explode!
13. It's a poison, 1gr can kill a person within 20 min to 24hr

Preparation Of Lead Azide [PbN_6]

1) Put 1 gram of Sodium Azide [NaN_3] into beaker contain 24 ml of water and mix well.
2) Put 1.75 gram of Lead Nitrate [$Pb(NO_3)_2$] (must grind it first) into another beaker, containing water of 23ml and mix well
3) Pour the 1st solution of Sodium Azide[NaN_3] to the solution of Lead Nitrate[$Pb(NO_3)_2$]
4) The solution formed is like a yoghurt complexion
5) After forming like a complexion, filter it using filter paper

[5] Note: If you are making an *impact bomb*using Lead Azide [PbN_6]–it is a must to fill the bomb fully. If it is not filled properly it might blast by even a minute movement (shaking etc). If any other Primary charge is available, do not use Lead Azide [PbN_6].

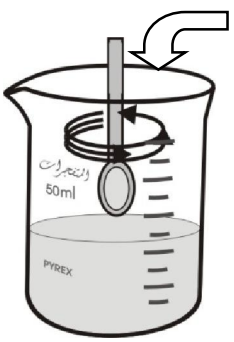
6) Lead Azide [NaN_3]crystals will remain in filter paper. And Sodium Nitrate [$NaNO_3$] settles down in the flask
7) Wash the Lead Azide [PbN_6] with a little water when it is in filter paper
8) Put in a dark place to dry
9) Once dry you can use it in detonator or can store in dark colored bottle and put water to it with ratio = 3 part Water [H_2O]: 1 part Lead Azide [PbN_6]
10) Process:

$$Pb(NO_3)_2 + NaN_3 \longrightarrow PbN_6 + NaNO_3$$

Note: by using silver nitrate [Ag NO_3] instead of lead nitrate [$Pb(NO_3)_2$]you can make silverAzide. All the properties and procedure are same.

Preparation Of Lead Azide [PbN_6] In Diagram:

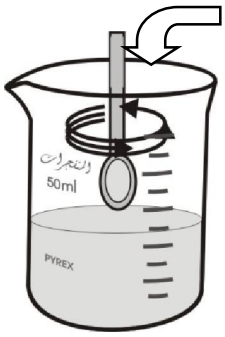
Step 1
1st solution



1.75g of *Lead Nitrate* [$Pb(NO_3)_2$]

23ml Water

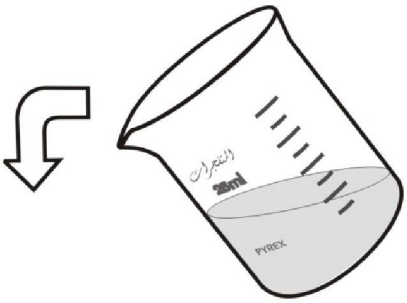
Step 2
2nd Solution



1g of *Sodium Azide* [NaN_3]

24ml Water

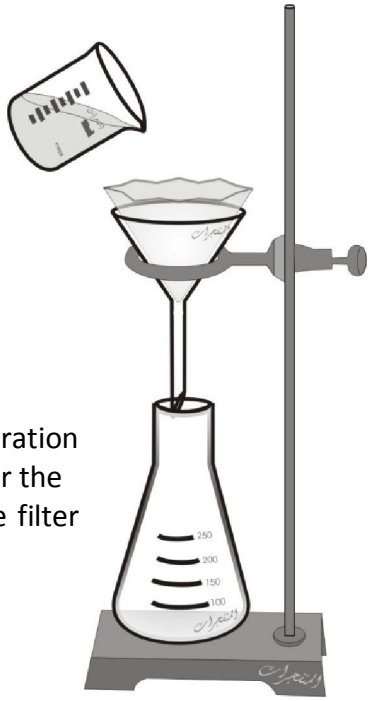
Step 3
Pour 2nd solution into 1st solution:
Lead Azide will be formed.



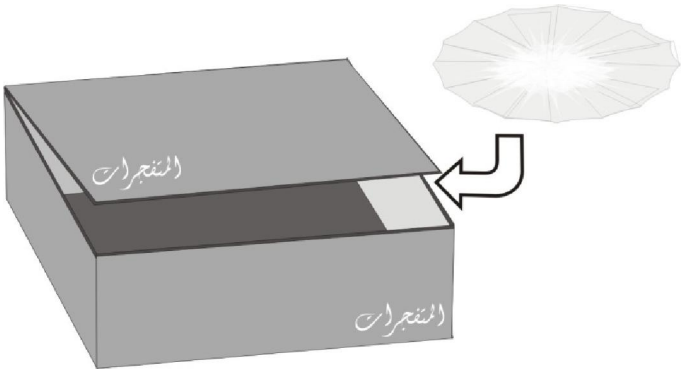
2nd Solution

1st Solution

Step 4
Use Filtration process to filter the Substance (use filter paper)



Step 5
Take the filter paper (which now contains the residue Lead Azide) and dry it in a dark room or in a closed box.



Uses Of Lead Azide [PbN_6]:

- It is put in detonators made of Aluminium [Al] or Zinc [Zn] which are stronger than other detonator
- The result of its explosion is:

$$PbN_6 \longrightarrow 4350°C$$

2. MERCURY FULMINATE[$Hg(CNO)_2$]

Properties:

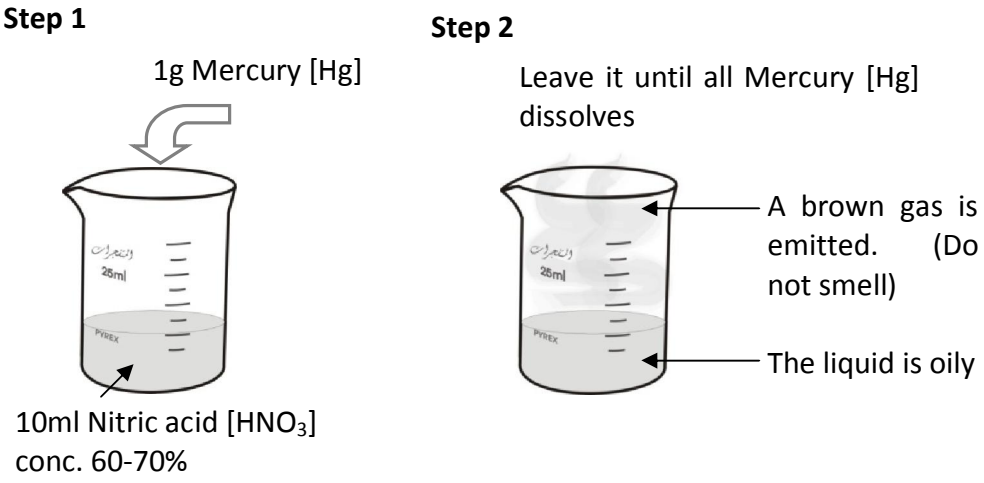
1. Under microscope it is in the shape of Octagon crystals.
2. Its density is 4.42 g/cm^3
3. It has numerous colors, white, brown and grey, the best being grey.
4. It is sensitive to heat, fire and electric current. Blasting temperature is 170 ^0C
5. Its speed of blast is 4500 m/s
6. It is not affected by light.
7. It is affected by humidity, if there is 15% humidity it will catch fire, but will not blast. If there is 30% humidity it will not fire or blast.
8. It does not dissolve in cold water, but it dissolves in the following items.
   a. in boiling water. 8g of Mercury fulminate[$Hg(CNO)_2$] dissolves in 100ml water.
   b. Dissolves in Ammonium Hydroxide [NH_4OH] mixture having the temperature 20°c to 30°c. But if temperature of mixture increases to 60°C, the process will be irreversible and the Mercury Fulminate[$Hg(CNO)_2$] will not be recovered.
   c. Dissolves in mixture of Acetone [C_3H_6O] and Ammonia [NH_3], and if you add water to this, Mercury Fulminate[$Hg(CNO)_2$] is recovered and is pure and stronger than before.
   d. Dissolves in mixture of Ethyl alcohol [C_2H_5OH] and Ammonia [NH_3].
9. The minimum temperature for it to blast is 180°C so it falls between Lead Azide and Acetone peroxide. So it is selected for use in normal detonators, capsules of bullets and other impact detonators of bullets and missiles. In 19^{th} century it was one of the famous primary charge in Military.
10. It is poisonous just like all salts of Mercury[6]
11. Its reactions with metals: it reacts with wet Copper [Cu] to form Copper Fulminate which has a very *weak* explosive power. But it does not react with dry Copper [Cu], rather it can be stored in it. It reacts with Aluminium [Al] metal and forms a non-explosive material.
12. To denature it: Put it in concentrated Sodium Hydroxide [NaOH] or in Aniline[$C_6H_5NH_2$], it would dissolve and finish off.
13. If it is in large amounts, store in water which will also depress its harmful vapors.

[6] Note: As it is poisonous, always handle Mercury [Hg] orMercury Fulminate [$Hg(CNO)_2$] carefully and do not touch with bare hands.

Preparation Of Mercury Fulminate [$Hg(CNO)_2$]

1) Take Mercury [Hg] using dropper and weight till you get 1gram.
2) Put this 1gram of Mercury [Hg] into a beaker 1 containing 10ml – 60 to 70% concentrated Nitric Acid [HNO_3] and allow reacting until Mercury [Hg] dissolves.
3) Now brown colored gases will emit (having no smell, but do *not* in hale it) allow all gases to finish emitting.
4) Allow reactions to continue until color of solution becomes brown and the Mercury [Hg] dissolves entirely. [7]
5) Pour 10ml of Ethyl alcohol [C_2H_5OH] into an empty beaker 2.
6) Then pour beaker 1 into beaker 2 (but if Ethyl alcohol [C_2H_5OH] is weaker you can pour it into beaker 1), the Mercury Fulminate [$Hg(CNO)_2$] will go grey, and white gases will also be emitted which is alcohol (do not smell it).If reaction gets out of control then pour a little amount of Methyl alcohol[CH_3OH] to settle down the reaction.
7) Allow these gases to come out and allow reaction to continue until beaker cools down and Mercury Fulminate[$Hg(CNO)_2$] settles down which can be of grayish color or brown or white.[8]
8) Now filter this and wash crystal powder with a solution containing 5 part water and 1 part Ethyl alcohol [C_2H_5OH].It is better if this solution is poured to beaker before filtering.
9) Collect crystals and allow drying in sunlight.
10) Once dry you can use in detonator with Lead Azide [PbN_6] or store in bottle of water at the ratio = 3 part Water :1 part Mercury Fulminate[$Hg(CNO)_2$]

Diagram For Preparing Mercury Fulminate [$Hg(CNO)_2$]

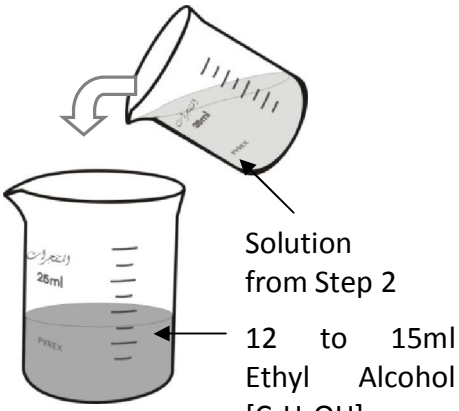


[7] Note: If you *boil* this liquid (entirely) what is left behind is $Hg(NO_3)_2$ –which is a *very* strong poison and is not affected by heat or light.

[8] If you make a good quality mixture, it should be *grey* color but if it is *brown*or*white* it is not perfect.

Step 3

After the brown gas is finished, pour the solution to Ethyl Alcohol [C_2H_5OH]



Solution from Step 2

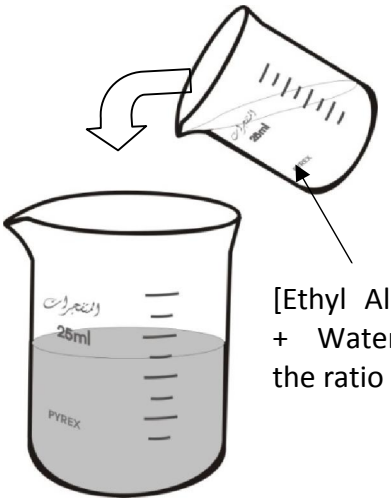
12 to 15ml Ethyl Alcohol [C_2H_5OH]

A white cloud of gas will be emitted. [Do not smell].

At this stage you will observe a layer of Mercury Fulminate [$Hg(CNO)_2$] forming.

Step 4

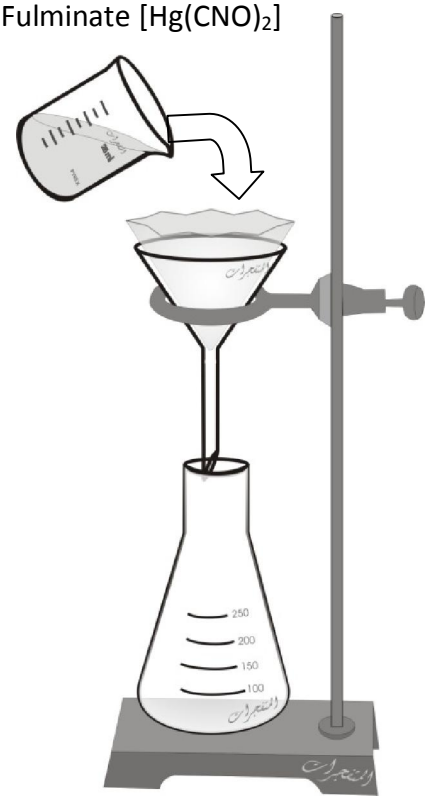
After the white cloud of gas is finished, pour [Ethyl Alcohol + Water] to the solution from Step 3.



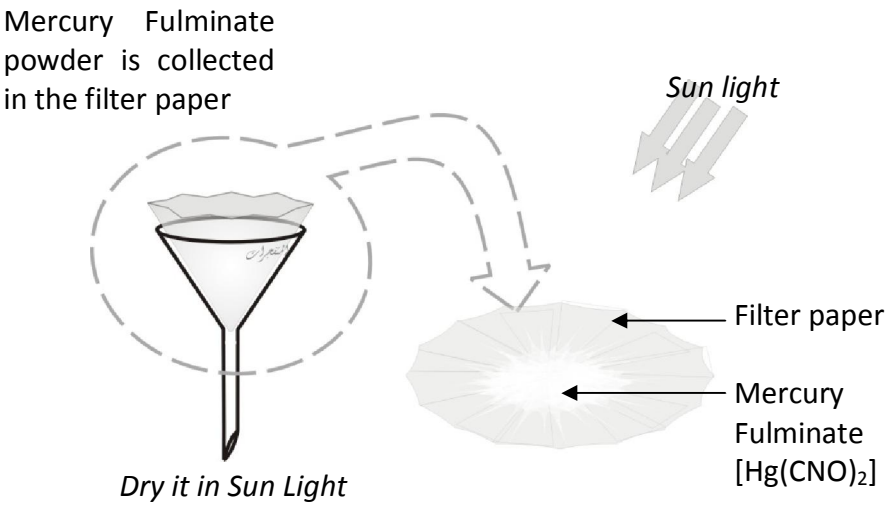
[Ethyl Alcohol + Water] In the ratio 1:5

Step 5

Filter the solution. The residue which remains in the filter paper is Mercury Fulminate [$Hg(CNO)_2$]



Step 5



Some Points Regarding Mercury Fulminate[$Hg(CNO)_2$]

- If the Ethyl alcohol [C_2H_5OH] is weak in concentration then pour it into the first mixture, usually we pour first mixture into the second mixture but not in the case of Ethyl alcohol being weak.
- After pouring into the Ethyl alcohol [C_2H_5OH] if the reaction gets out of control (eg. Temperature rises)then put a few drops of Methyl alcohol [CH_3OH] into it and it should come under control.
- Do not smell any gas during these reactions.
- The purpose of using Ethyl alcohol [C_2H_5OH] mixed with water in the process is to make the product pure.

Note: if the reaction with mercury delays for long time then heat slowly until you see white fumes comes out, then continue the process.

Uses Of Mercury Fulminate [$Hg(CNO)_2$]

It is used in impact detonators, normal detonators, capsules of bullets and missiles. It is advised to use other primary charges if available instead of mercury fulminate, due to its weakness.

3. DICYCLO and TRICYCLO ACETONE PEROXIDE

Properties

1. White crystal like flour.
2. Smells like Acetone.
3. Very sensitive to friction and heat, electric current and when impacted, in all cases it blasts. The cooler the more sensitive it is.
4. If only one drop of Sulphuric Acid [H_2SO_4] is drop in it, it blasts.[9]
5. Temperature which it blast is 86^oC.
6. Speed of blast is 5200 meter per second.
7. Does not dissolve in water but dissolves in Acetone [$C_6H_5NH_2$], Chloroform [$CHCl_3$] and Toluene[10] [$C_6H_5CH_3$]. After dissolving add water to reform it.
8. If left in open air it slowly starts evaporating and within three months its weight reduces to half.
9. Its storage is in water if it is in large quantity.
10. The TricycloAcetone Peroxide [$C_9H_{18}O_6$]is slightly powerful then DicycloAcetone Peroxide [$C_6H_{12}O_4$].
11. The density of TricycloAcetone Peroxide [$C_9H_{18}O_6$] is 1.22 g/cm^3. (This process is done by endo-thermal reaction. That's temperature between 30^oC to 42^oC)
12. And DicycloAcetone Peroxide [$C_6H_{12}O_4$] is 1.18 g/cm^3.(This process is done by exo-thermal reaction. That's temperature between 5 – 10^oC)

Uses:

This is one of the stable primary charge known and powerful can be used for making detonators.

Preparation Of Dicyclo Acetone Peroxide [$C_6H_{12}O_4$]

1. Pour 10ml Hydrogen Peroxide [H_2O_2] which having 25% concentration[11] in to a beaker(1) containing 10ml of Acetone [C_3H_6O]

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[9]Therefore it is used in *chemical* detonators. See "Chemical Detonator" p.54

[10]Toluene: Methylbenzene [$C_6H_5CH_3$](Furniture Polish), A colorless flammable liquid obtained from petroleum or coal tar; used as a solvent for gums and lacquers and in high-octane fuels

[11]***How to get concentration of Hydrogen peroxide (H_2O_2)?***

Make sure you use the correct concentration of a substance depending on the mixture. Method to find out the concentration of H_2O_2:

- Pour 35 ml of H_2O_2 to a graduated cylinder.
- Calculate the weight of 35 ml of H_2O_2 using a table balance or electric balance.
- And find the concentration using the formulae:

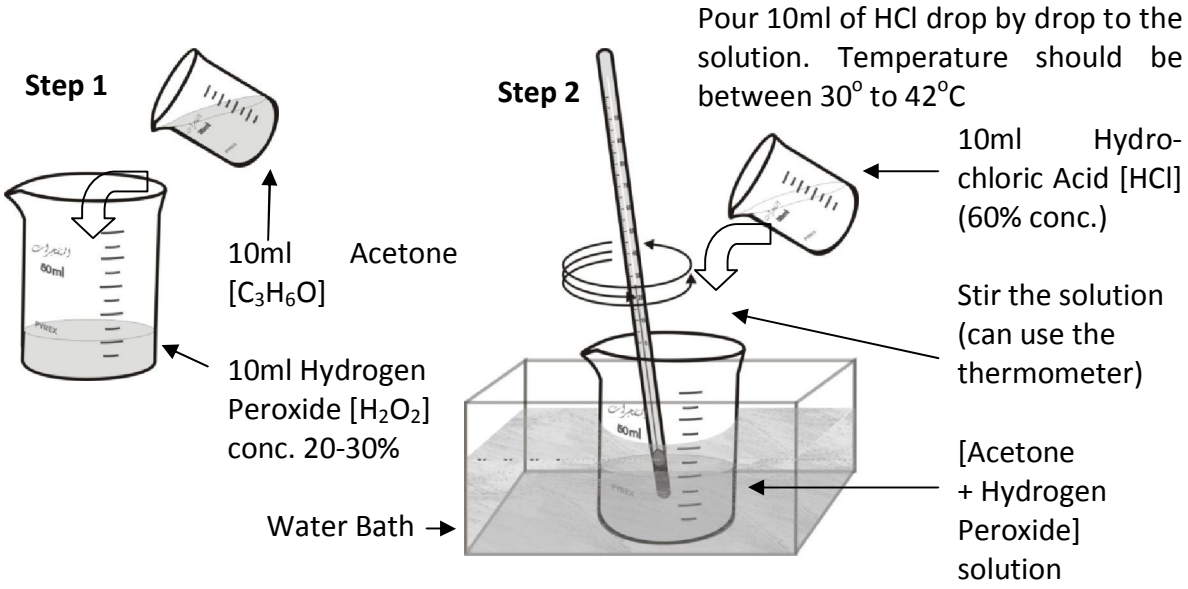
Concentration of H_2O_2 = (Mass of 35 ml – 35)/ 0.13

2. Pour 10ml Hydrochloric Acid [HCl](conc. 60%) slowly drop by drop in to beaker 1.
3. During this whole process when pouring Hydrochloric Acid [HCl] use a thermometer keeping temperature between 30°C to 42°C. If temperature rises above 42°C make sure that you have a cold water bowl(water bath) nearby you to place the beaker in to the bowl so it cools down, making sure water does not enter the beaker. If needed add ice cubes or Ammonium Nitrate [NH_4NO_3] crystals (which is having cooling effect) into the water bath to cool down.
4. Then stir for 5 to 10 minutes still keeping temperature between 30°C to 42°C.
5. Mixture should change into semi flour like shape (liquefied) if not, then leave for 1 to 2 hours.
6. After the "semi-flour" complexion is formed, then pour into it a solution of Sodium Carbonate [Na_2CO_3]. Keep pouring and stirring and check with pH paper until pH becomes neutral (pH 7)
7. Once it becomes neutral use filtration process to collect the crystals.
8. Dry the crystals in sunlight.
9. Once dry you can use it in detonators or store in water in the ratio = 3 :1.
10. Process

$$2C_3H_6O + H_2O_2 \xrightarrow{HCl} C_6H_{12}O_4 + H_2.$$

Note: Here Hydrochloric Acid [HCl] is used as a catalyst[12].

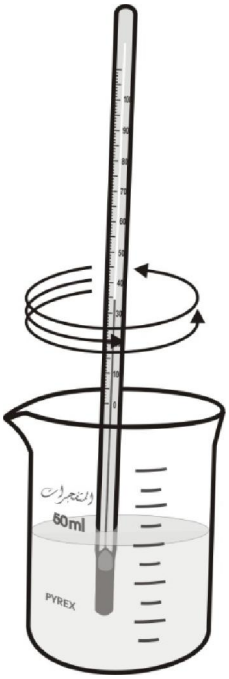
Preparation Of Dicyclo Acetone Peroxide [$C_6H_{12}O_4$] In Diagram



[12] Catalyst: A substance which increases the speed of chemical reaction without itself under going any permanent chemical change. Generally a substance that increases the reaction is a positive catalyst, some reactions are slowdown by negative catalyst. The name of whole process is called catalysis.

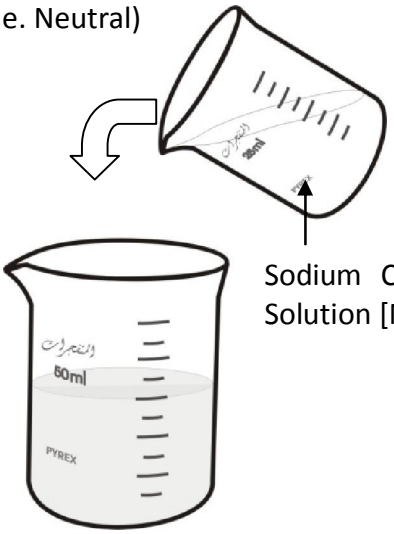
Step 3

Stir for 5 to 10 minutes and if a "yogurt like" layer is not formed leave it covered until it is formed. (this layer is Dicyclo Acetone Peroxide)



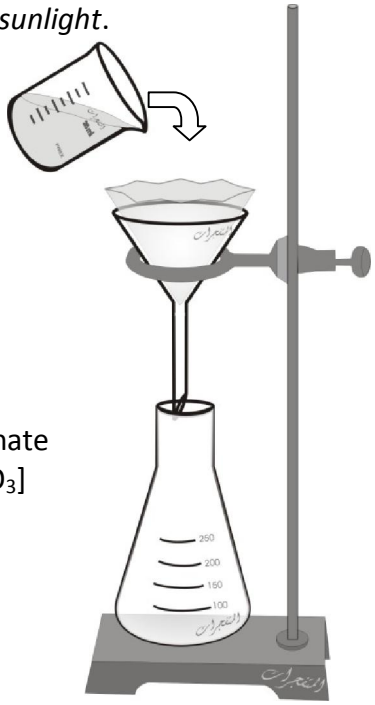
Step 4

Pour Na_2CO_3 solution till pH of the solution is 7 (i.e. Neutral)



Sodium Carbonate Solution [Na_2CO_3]

Filter the solution from step 4. Collect the residue (which is collected in the filter paper) and *dry it in sunlight*.



Preparation Of Tricyclo Acetone Peroxide[$C_9H_{18}O_6$]

1. Slowly pour 9ml Hydrogen Peroxide [H_2O_2] (20-30% conc.) into a beaker 1, containing 15ml of Acetone.
2. Reduce temperature to 5 – 10^oC using a bowl of cold bath.
3. Once you have reduced temperature then take 1ml of SulphuricAcid [H_2SO_4] in a separate beaker. And by using a dropper, slowly add it [H_2SO_4] drop by drop in to the beaker 1. Remember to keep the temperature between 5 – 10 ^oC.
4. Then stir for 5 – 10 minutes.
5. Cover and leave for 2 – 3 hours.
6. Use Sodium Carbonate [Na_2CO_3] solution to neutralize as like before in Dicyclo acetone peroxide, to suck out access acids and use pH paper to check.[13]

[13] Note: As soon as mixture becomes flour like substance then add Sodium carbonate solution and water. Otherwise it may explode and remember always pour solution to the mixture and check acidity using pH paper continually just in the case mixture become alkaline, which means you will have to add the left over solution of filtration into it to get it neutral again and as with all mixtures pour denser substance to the one with less density.

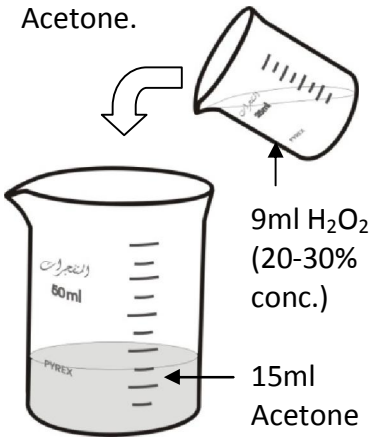
7. Once neutral use filtration process and collect flour like crystals in filter paper and place under the sunlight for drying.
8. Once dry you can use in detonator or store in the water at the ratio is 3:1.
9. Process:

$$3H_2O_2 + 3C_3H_6O \xrightarrow{H_2SO_4} C_9H_{18}O_6 + 3H_2.$$

Preparation Of Tricylo Acetone Peroxide[$C_9H_{18}O_6$] In Diagram

Step 1

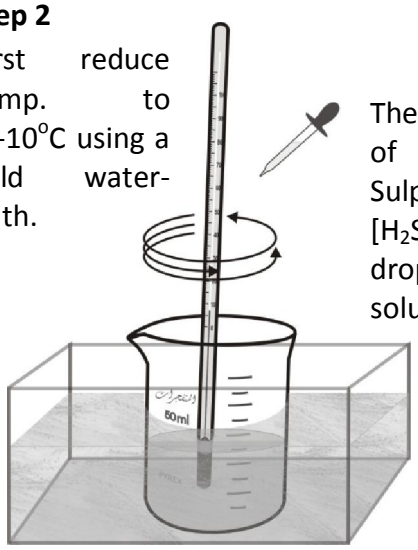
Pour 9ml of Hydrogen Peroxide to 15ml of Acetone.



Step 2

First reduce temp. to 5 -10°C using a cold water-bath.

Then pour 1ml of (98% con.) Sulphuric Acid [H_2SO_4] drop by drop into the solution



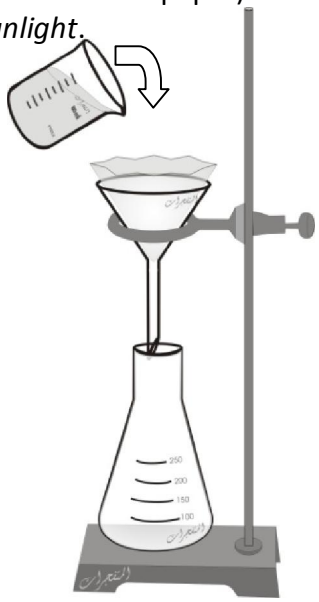
Step 3

Stir for 5 to 10 minutes and if a "yogurt like" layer is not formed leave it covered until it is formed. (this layer is Dicyclo Acetone Peroxide)

Step 4

Pour Sodium Carbonate [Na_2CO_3] solution till pH of the solution is 7 (i.e. Neutral)

Filter the solution from step 4. Collect the residue (which is collected in the filter paper) and *dry it in sunlight*.



4. HEXAMINE PEROXIDE [$C_6H_{12}O_6N_2$][14]

Properties

1) It is in the form of *white* crystals, semi flour like form and has a smell like fish.
2) The density is 1.57g/cm^3
3) It does not dissolve in anything at normal temperature and does not evaporate.
4) Speed of blast is 6150m/s.
5) Temperature which it blast is 200^oC.
6) When boiled in water for 24 hours it decomposes and cannot be recovered.
7) Less than Hexamine Peroxide burns with a drop of Sulphuric Acid. If it is in small quantity it will not blast but only burn.
8) Doesn't react with most of the metals.
9) In moisture state it may not explode.
10) Sunlight doesn't affect the strength.
11) For making Hydrogen Peroxide never use more than 30% H_2O_2 and do not use Nitric Acid as a catalyst, it may explode.

Uses:

1) Used in normal and electric detonators.
2) It is also used in impact detonators and is safer to use because of its sensitivity, its neither very sensitivity nor too less.
3) You can make blasting fuel, like *cortex*, this can be made by making a mixture of this Hexamine peroxide with Engine oil or Glycerin, such that the ratio is 1part Engine oil and 3parts Hexamine peroxide(Hexamine peroxide with Engine oil is better).

Preparation Of Hexamine Peroxide[$C_6H_{12}O_6N_2$]

1) Take 3.5grams Hexamine[15] and put it into beaker1 containing 11.25grams Hydrogen peroxide (20 - 30% concentration).
2) Add 5.25grams of concentrated Citric Acid [$C_6H_8O_7$] or Acetic acid [CH_3COOH] to beaker 1.
3) Mix well for 30minutes, temperature should be between 30-42^oC,then cover and leave it in a bowl of cold water till it becomes semi flour like (don't leave unattended)

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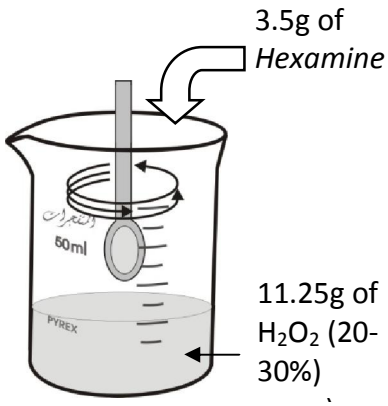
[14] Note: Our Sheikh recommends that the best activating explosive for guerilla warfare for the Mujāhidīn is Hexamine peroxide and Acetone Peroxide because they are easily available and are easily prepared and strong.

[15] To "How to extract *Hexamine* from *White Coal*": See footnote #4

4) Once semi flour, pour on top of it the solution of Sodium Carbonate [Na_2CO_3], keep pouring and stirring till it become neutral. Also to make it more pure wash it with 5 part Alcohol and 1 part Water solution.
5) Once neutral, filter it, collect crystals and leave it to dry in sun.
6) Once dry you can use it in detonators or you can store it in water, in the following ratio = 3 part Water : 1 part Hexamine Peroxide.
   Note: you can make the same process butendo-thermal reaction between 5 to 10°C. The outcome is better quality, stronger then exo-thermal reaction.

Preparation Hexamine Peroxide [$C_6H_{12}O_6N_2$] In Diagram

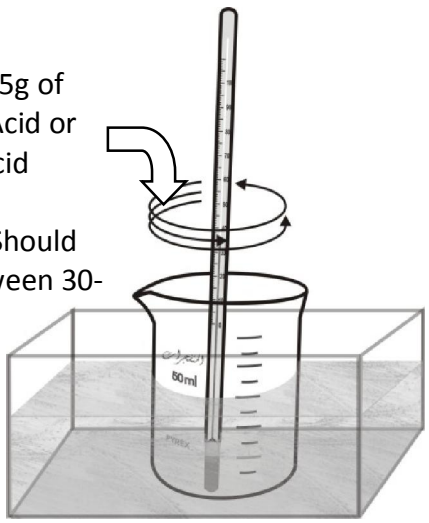
Step 1



Step 2

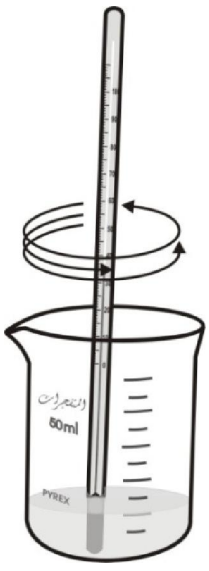
Add 5.25g of Acetic Acid or Citric Acid

Temp. Should be between 30-42°C



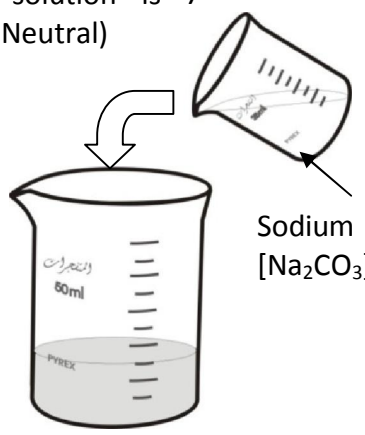
Step 3

Stir for 30 minutes and if a "yogurt like" layer is not formed leave it covered until it is formed. (this layer is *Hexamine* Peroxide)



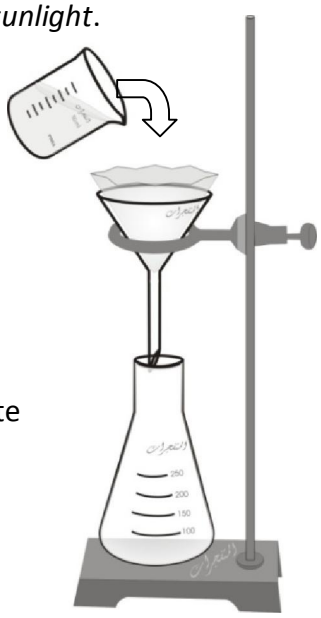
Step 4

Pour Na_2CO_3 solution till pH of the solution is 7 (i.e. Neutral)



Step 5

Filter the solution from step 4. Collect the residue (which is collected in the filter paper) and *dry it in sunlight*.



DETONATORS

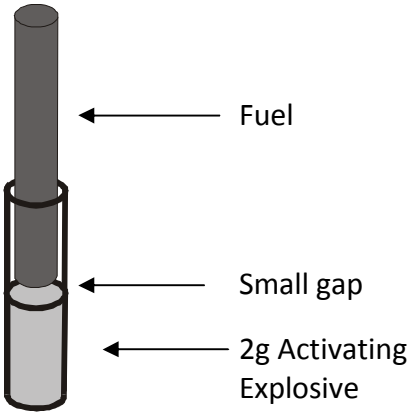
They are cylindrical in shape, made of paper, plastic or metal containing an activating (primary) explosive. They are closed from one end and open at the other so that you can place a fuse in it [16] –if it is a normal detonator, but close from both ends if it is an electric detonator.

Main Types Of Detonators

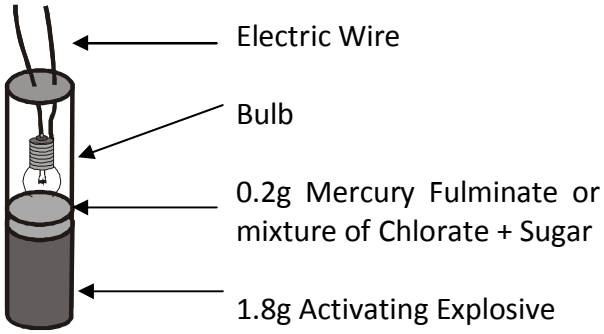
i. A Normal Detonator:

This is a normal detonator containing 2g of any Activating Explosive.

As you can see we have left a small gap when placing the fuel in it.



ii. An Electric detonator:



This is an electric detonator which is usually smaller containing 1.8g of any activating explosive and is topped by either 0.2g Mercury Fulminate or a mixture of Chlorates and Sugar. There are two wires placed in it, which connects it to battery for detonation.

If you are exploding a big Main charge then use 3g to ensure that main charge blast. The detonators used by the military do not contain more than 1g of activating explosive where as we use 2-3g.

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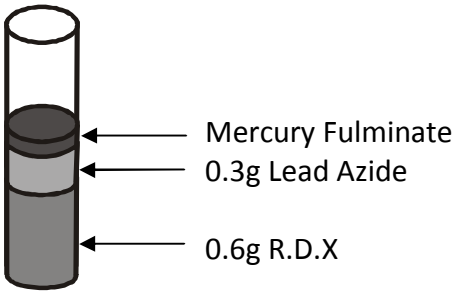
[16] NOTE: When placing fuse in it, leave a small gap between the activating explosive and the fuel, and then tape the fuse and detonator in such a way that the fuel does not fall out.

Here is an example of a typical Military detonator:

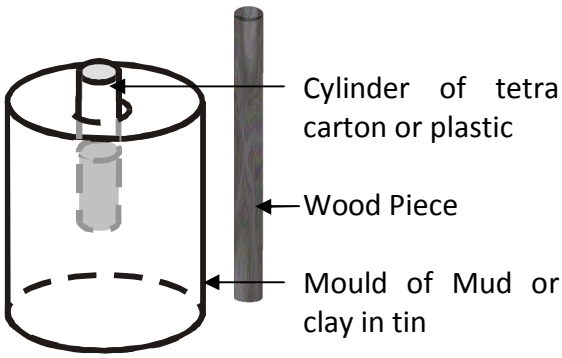


This Military Detonator contains 0.6g of R.D.X which is a secondary explosive, and 0.3g of Lead Azide [PbN_6] topped by Mercury fulminate[$Hg(CNO)_2$] all coming to a total of 1g.

For blasting solid TNT[17][$C_6HCH_3(NO_2)_3$], Military Detonators are good because it uses both primary charge and a secondary explosive. Remember that solid TNT is an insensitive explosive whereas the explosive we use as main charge are usually Semi-Sensitive, thus we do not require a good secondary charge inside our detonators. If TNT is in powder form, our detonators can also blast it.

How To Make Detonators

Cut out a piece from Tetra Carton (or any carton similar) and using a pen or something similar roll it to make a cylindrical shape. Then tape it and close the bottom. Then fill the cylinder with 2g of any Activating Explosive such as Acetone Peroxide[$C_6H_{12}O_4$ or $C_9H_{18}O_6$], Hexamine Peroxide[$C_6H_{12}O_6N_2$] or Lead Azide [PbN_6]etc.



When packing detonators make sure you use a mould of mud or clay in a tin (as shown in the diagram) and use a piece of wood to push down the Activating Explosive powder tightly, making sure the Activating Explosive is tightly packed in the detonator.

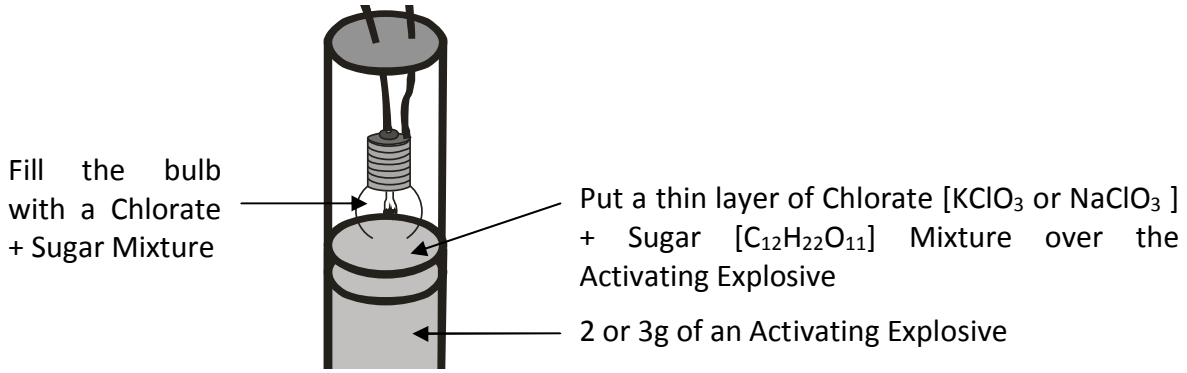
In this procedure your face should be kept away from the top of the mould and hand should be on top of the stick.

Note: If you are using Lead Azide [PbN_6] as an Activating Explosive, put a layer of Mercury Fulminate[$Hg(CNO)_2$] or a layer of Chlorate [$KClO_3$ or $NaClO_3$] + Sugar [$C_{12}H_{22}O_{11}$] over it and never leave any space.

---

[17]TNT: Tri Nitro Toluene [$C_6HCH_3(NO_2)_3$]: It is a very popular explosive in all militaries. It is in solid form. It dissolves in 71°C – 82°C. It is in a yellowish colour. It is not sensitive to impact and also not affected by humidity. You can melt TNT and it will be less sensitive to heat and its power would decrease when melted. It does not react with metals but dissolves in water. It can be in many forms and in many sizes (10X5 cm cube in 400g or 10X2.5 cm cube in 200g or 75g in cylinder shape). C4, C3 and many Explosive Mixtures that we will learn in this course are much more powerful than TNT.

For electrical detonators get a small "*christmas* tree" bulb and break its glass but not the two strands that are inside it, and connect it to the wires. Dip inside it Chlorate + Sugar mixture, and place it on top of the Activating explosives. See Below:

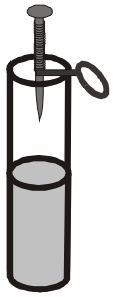


Some safety precautions while manufacturing Detonators

- Great care is needed to ensure the safety of the manufacturer due to the high sensitivity of the primary explosives. Treat it well and avoid mistakes as it may be your last mistake.
- Must dry the explosive material very well for at least an hour in sunlight before using it in the detonator. This is to eradicate any moisture.
- Use the "clay mould" so if an explosion occurs, it will be depressed. Remember to keep your face away from the top of it and use one hand on the furthest position of the stick (away from the explosive material). Also you can use other improvised safe methods too. This work should be done in safe area.
- Metallic detonators can also be used keeping in mind the type of explosive been used, from experience the best detonator caps are 5 or 3ml injection shells. It is non reactive, humidity and water proof if you use resin epoxy to seal it.
- There must remain a small gap between the activating explosive and the fuel in the Normal detonators.
- In the Electric detonators put a small amount of [chlorates + sugar]mixture on the broken head of the bulb.
- Must press down the explosive material very well and tight to obtain the maximum performance.
- Some of the primary charge like Tri and Di acetone peroxide produces an explosive gas due to high temperature and long time in shelf. Always when you open it try to open in open area far away from any action, which may initiate this explosive gas in to hazard bomb. Also when you open the container unscrew cap slowly to avoid friction. Also when returning the cap, make sure that there is no powder around the cap's wall.
- Store all types of primary charge far from main charge at least 7m away. And if you store for long time store in water at the ratio 3 parts primary charge and one part water.

Detonators And Their Ways Of Detonating

1. Mechanical Detonator:



This type of detonators blasts when the pin above is pushed down into it. Eg. It is used in mines.

2. Normal Detonator:

This is a normal detonator which blasts when lit by fire.

3. Electric Detonator:

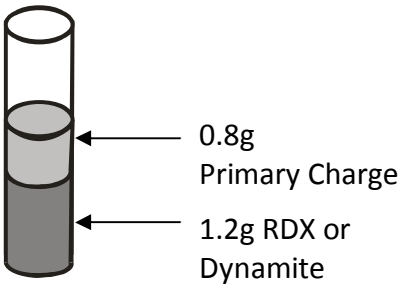
This is an Electric Detonator which needs a power source to blast it.

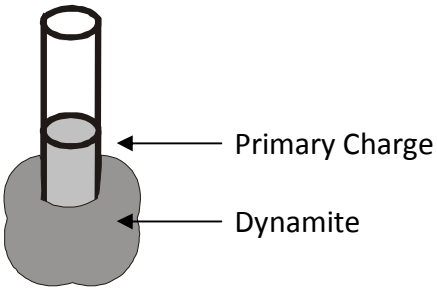
4. Chemical Detonator:

This is a chemical detonator containing an activating explosive with a layer of chlorate [$KClO_3$ or $NaClO_3$] + Sugar [$C_{12}H_{22}O_{11}$], on top contains an empty medicine capsule filled with Sulphuric Acid [H_2SO_4] (at least 7 drops.) and its middle taped. The acid will slowly dissolve the capsule two ends, once the acid reacts with the mixture, the blast occurs.

Point to Remember! In this detonator you must test the capsule procedure to find out how much time it takes the acid to dissolve the capsule and explode. In normal capsule it takes 30 to 40 min. Also to make sure there is no leak of acid, put the capsule in white mix before inserting it to detonator.

5. Compound Detonator:





Sometimes a secondary charge is used but if we make our activating explosives strong there is no need to make a secondary charge. A secondary charge is used sometimes to increase the blasting power and to make sure that the Main Charge blast.

Dynamite in Compound Detonator

In compound detonators you can use secondary charge like that of “dynamite". Dynamite is made of [Nitro Glycerin +*mixtures*]. We can use thousands of mixtures. But in this course we will use Wheat or Wood powder in the ratio 3:1 (i.e. *3 part* Nitro Glycerin and *1 part* Wood Powder or Wheat).

FUELS (FUSES)

Fuels ⟶ Activating Explosives ⟶ Main Charge

Fuels are the middle man between the ignition sources and the bomb. Eg. fire is the source of ignition and fuel carry it to the Activating Explosive.
Explosives are divided into 3 types according to their sensitivity:

1. Very Sensitive, i.e. Activating explosives
2. Semi Sensitive, i.e. Secondary charge
3. Insensitive, i.e. some explosive mixture used as main charge.

Types Of Fuels According To Their Property

i. Slow (speed 1 – 2 cm/s) Eg. All slow burning mixtures like white powder

- Made of paper or plastic
- Mixture is not grinded well and not soft

It is made of a cylinder made of plastic or paper (which is thin like news paper), the cylinder is very narrow (diameter is 3mm) and contains small particles inside it which are loosely packed.

ii. Fast (30 m/s)Eg. Nitro cellulose

- Made of paper or plastic
- Mixture is grinded well and soft

It is slightly wider than the slow ones (diameter is 12mm), it is made of plastic or paper and particles are placed together neatly.

iii. Explosive (7 to 8 km/s)

- Made of paper or plastic
- RDX, P.E.T.N or Hexamine Peroxide with engine oil [in 3:1 ratio] is used

It is in the form of a cylinder of plastic or paper (with a diameter of 3mm), containing semi-sensitive substance (secondary charge like RDX or PETN). It requires a detonator and a slow fuel to explode.

Types Of Fuel Mixtures[18]

NAME OF FUEL	HOW TO MAKE	IMPORTANT POINTS
White Explosive	Grind 1 part of Chlorate[19]. (Potassium chlorate is better). Then add 1 part grinded and sifted sugar. Then mix the two in a bag and sift again. Now it can be used as a fuel. Or you can add water and make a concentrated liquid mixture out of it. Put threads to this liquid, when these threads becomes totally soaked in the liquid then you allow it to dry. You can use this as a fuel. But There must be a small amount of chlorate and sugar mixture on the receiving end i.e. inside the tip of detonator.	It is used inside cylinders made of plastic or paper. Its burning speed is 1.4cm/ 4.5s
Powder in head of matches	Get a few boxes of matches and scratch the heads off. Now grind these particles to powder and sift it well. Place it in fuel cylinder.	Used inside plastic or paper cylinders. Speed is 0.7cm/s
Grey Fuel	6 parts Chlorate 1 part Charcoal and 1 part Sulphur.	Speed is 1 cm/5s. It is also explosive, be careful.
Silverish Explosive (Used in impact bomb)	2 Chlorate : 1 Aluminium Powder : 1 Sulphur Powder	Speed is 1 cm/0.7 sec. After preparation of mixture, be careful because it explodes if impacted or if too much pressure is applied to it.
Black Powder	7.5 Potassium Nitrate : 1.5 Charcoal : 1 Sulphur Powder	Put it in paper cylinders. Speed is 1cm/ 15sec.
Potassium Permanganate	Grind well and use, it catches fire by 1 drop of Glycerin.	Be careful when grinding. Place in cylinder of plastic or paper. Speed is 1cm/3sec.
Fuels which catch fire with one drop of water.	1 Ammonium Nitrate : 4 Ammonium Chloride : 4 Zinc Powder	Speed is 1cm/2sec.

[18] For Details on Manufacturing Explosive Mixtures, such as chlorates and Nitrates, see the next Section.

[19] When we mention chlorate, it means either Sodium Chlorate or Potassium Chlorate.

	1 Silver Nitrate : 1 Magnesium Powder	Speed is 10m/ sec. Good for martyrdom operations due to its speed.
	2 Iodine powder : 1 Aluminium Powder	Speed is 1cm/3sec. Drawback: Violet coloured fumes are emitted in large quantity.

Points to remember

- White explosive is the best, grey fuel is second and match-head is the third –even though they are not fast as the rest, but their reliability is good.
- Grinding and sifting is required for all mixtures, the power of a mixture depends on how well it has been grinded, sifted and pureness of it. Once you have mixed powder mixtures by placing them one by one in a single plastic container such as a bag, use your hands on the outside of the bag to mix and shuffle. Once they have blended and mixed with each other then sift again.
- When grinding keep face away from mortar and pestle, specially powder of mach stick measure using bags one contain mixture and on other side of scale put an empty bag to start off with.
- The more tightly you pack the fuel in the cylinder the better it burn.
- When you make a fuel cylinder attach a match-stick to its head, so that when you light it, it catches fire easily.
- In bullets and bombs black powder with magnesium powder (in 1:1 ratio) is used, it is a very powerful mixture.
- You must test every mixture that you prepare in small quantity before actually using it.

NOTE: The length of paper used for making fuel cylinders can be 14cm long and 11cm wide when cutting it out, and can be thin like that of thermometers diameter. If it is thick it will take too much time for burning. The walls of fuels must be very thin, but that of detonators must be strong (for detonators use plastic such as that in “tetra cartons” or “milk cartons” also 5ml injection can be used)

PART THREE: Section Two

ii. MANUFACTURE OF MAIN CHARGE

ii. MAIN CHARGES

Mixtures
e.g. NH_4NO_3 + Al

Compounds
e.g. TNT

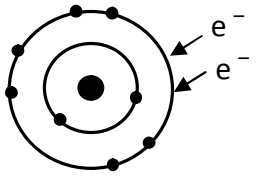
Explosive Mixtures:

We are now in the final stage which is preparing the main charge or explosive mixture. An Explosive Mixture should consist of an "*Oxidizing"* and a "*Reducing"* Agent, which will react to form an explosion. For Example: Ammonium Nitrate [NH_4NO_3] (which is an *Oxidizing* Agent) reacts with Aluminium (which is a *Reducing* Agent) to form an *explosion*.

An ***Oxidizing Agent*** is an element which readily gains electrons to its last orbit to be stable, whereas a ***Reducing Agent*** is an element which readily gives electrons from its last orbit to be stable.

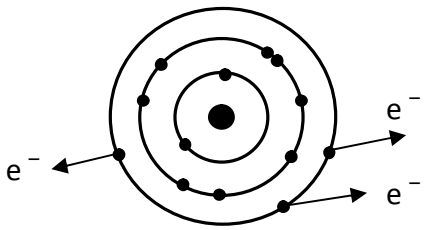
Example:

Oxidizing Agent



Oxygen Atom [O^{8}_{16}]

Reducing Agent



Aluminium Atom [Al^{13}_{27}]

Conditions Required For Making An Explosive Mixture:

1. Presence of an Oxidizing Agent. Eg. Potassium Nitrate [KNO_3], Ammonium Nitrate [NH_4NO_3], Potassium Permanganate [$KMnO_4$], Hydrogen Peroxide [H_2O_2].
2. Presence of a Reducing Agent. Eg: Sugar [$C_{12}H_{22}O_{11}$].
3. Taking place of a "reaction" between these Oxidizing and Reducing Agents.[20]
4. This "reaction" should be an Explosive one. i.e. It should produce gases at High Temperature in very Large Quantity in Very Small Amount of Time.

[20] This is known as Theoretical Knowledge and actually performing them.

Condition And Safety For Making A Big Mixture

- Keep primary charge in sunlight, at least for 1hour before making detonators.
- We must dry mixture and material before mixing.
- We must test a random quantity of mixture before operation.
- If you use primary charge, use at least 3grams for detonator, and must use at least 2 detonators for 1mixture.
- If you use any mixture of Nitrate, avoid it from humidity.
- Put the detonator as the last thing, before going to operation.
- Check the temperature of mixture before putting detonator, if temperature is above 50^{o}C, do not put detonator.
- When making a big mixture, divide it between groups, to make small amounts. To avoid danger and as well as it will be mixed properly.
- When grinding or mixing, keep a large quantity of water near you for safety.

Conditions for Effective Working of an Explosive Mixture:

- Grind each element well *separately*.
- Try to keep the grinded elements as *clean* as possible.
- Mix *less* Sensitive substances First, and *more* Sensitive ones later.
- Before mixing substances and before exploding them, make sure that they are *dry*.
- Mix very well the components of the mixture, so it becomes *homogenous* (blended).
- Sift each substance *separately* before mixing, and sift the mixture after mixing well.
- Must keep the mixture away from *humidity*, so put Plastic Casing and pack it well.
- *Before* adding the Detonator to the mixture, and before going for the Operation, you must check the Temperature of mixture, if it is less than 50^{o}C, its fine. Otherwise, it is safer to wait until it cools down.

Conditions for the Powerfulness of an Explosive Mixture:

- The components of the Mixture, should be mixed in the Ideal Ratio, which you can find out Theoretically or Practically Experimenting[21]
- Use such other materials alongside the main Mixture, which increase the Explosive power, such as a Gas Cylinder, or a Barrel of Diesel, or Flammable Petroleum.
- The denser the material used to make Mixture, the more powerful the blast.
- Press down the Explosive use, well.

[21]The ratios given in this course have been verified by our Sheikh and are most ideal, you can also further experiment on this: See p.84

- Put the Mixture inside some container, such as a Barrel for blasting, instead of blasting it in open air. Also good booster will help for big blast.

Issue: How To Use Given Ratios To Find Actual Quantities

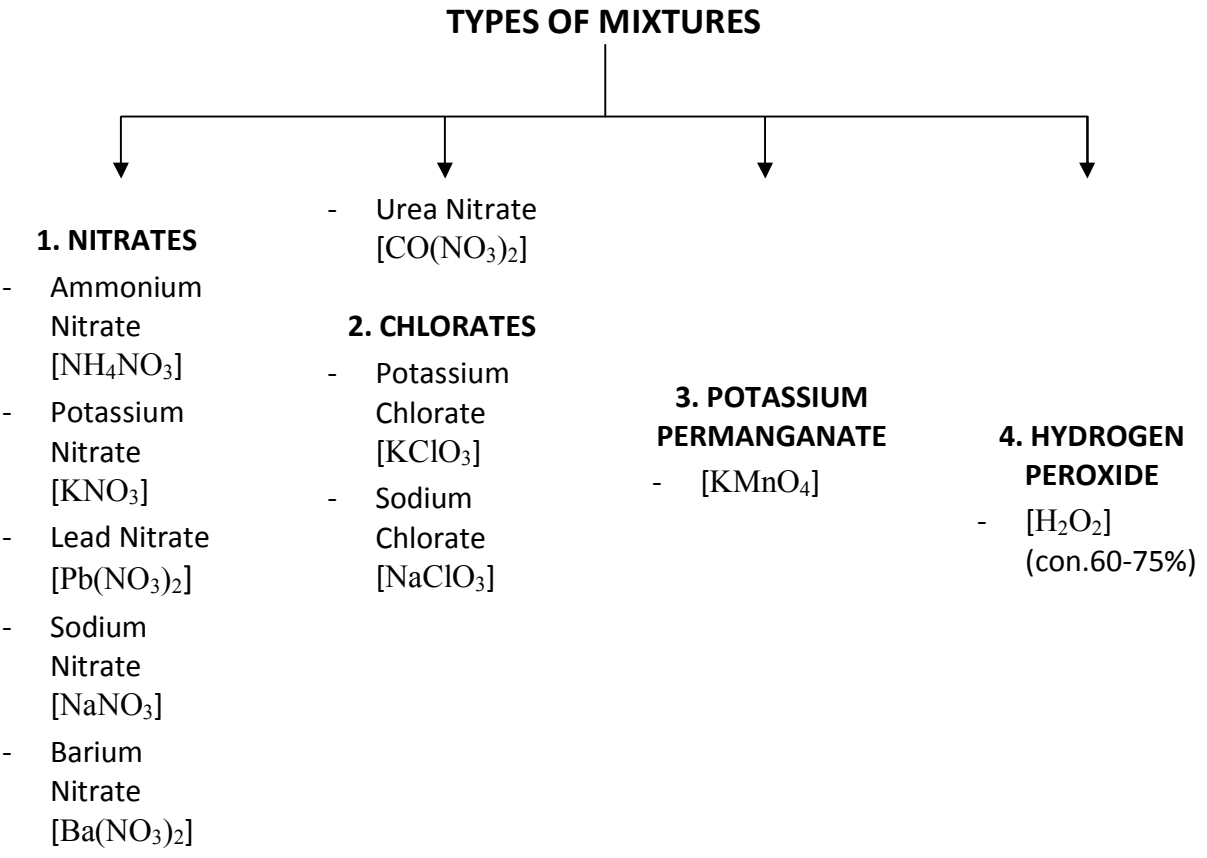
The given ratio for an Explosive mixture is for example:

Ratio = 4.4 Ammonium Nitrate [NH_4NO_3] : 1 Aluminium Powder [Al]

Suppose we want to make this explosive mixture, weighing a total of 100g. Hence to find out how much of Ammonium Nitrate [NH_4NO_3] and how much of Aluminium Powder [Al] should be used to produce 100g of explosive:

1. Divide the total quantity we want by the sum of both the ratios:
   Total quantity needed= 100g
   Sum of ratio =(4.4+1) =5.4
   Therefore 100g/5.4 =18.5
2. Multiply the ratio of each element to the result from step 1:
   18.5 x 4.4 = 81.5g of Ammonium Nitrate [NH_4NO_3]
   18.5 x 1 = 18.5g of Aluminium Powder [Al]

These are the weights in which we will take Ammonium Nitrate [NH_4NO_3] and Aluminium Powder [Al], to prepare a total 100g of mixture. (Note: If you sum up the two results; 81.5g and 18.5g then thetotal is 100g)



1. NITRATES

All Nitrates are in *white* color. All are available from agriculture shops as fertilizers with the exception of "Urea nitrate" (which is not available). But we can get *Urea* (not Urea Nitrate) from agriculture shops[22]. Thus Urea Nitrate can be easily prepared by adding [Nitric acid] to [Urea].

Although the Nitrates are easily available, we will brief on how to prepare them using Nitric Acid and salts. Remember that the concentration of Nitric Acid [HNO_3] used for the preparation of all these *Nitrates* should be between 60 -70%

AMMONIUM NITRATE:

How To Prepare Ammonium Nitrate

It can be prepared by adding Nitric Acid [HNO_3] to Ammonium *Hydroxide* [NH_4OH]

$$NH_4OH + HNO_3 \longrightarrow NH_4NO_3 + H_2O$$

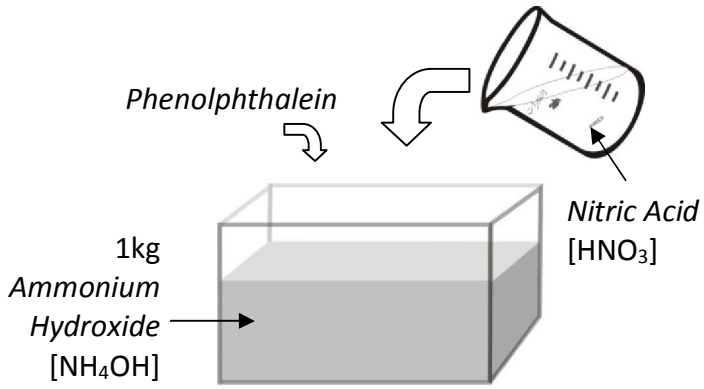
Or by adding Nitric Acid [HNO_3] to *Ammonium* [NH_4]

$$NH_4 + HNO_3 \longrightarrow NH_4NO_3$$

Add 1 kg of Ammonia [NH_3] or Ammonium Hydroxide [NH_4OH] to a plate, and add phenolphthalein, it gives a red color to alkaline solutions. Then start adding Nitric Acid [HNO_3] to it, till it becomes color less. Then dry it in sunlight. After drying you will have a very pure Ammonium Nitrate [NH_4NO_3].

First pour Phenolphthalein to Ammonium Hydroxide [NH_4OH], then pour Nitric Acid [HNO_3] (conc. 65%) till the solution becomes colourless.

Then leave in Sunlight till it is formed.



[22] Urea can also be prepared by heating *Urine*. About 10 glass of Urine will give 1 glass of Urea.

POTASSIUM NITRATE

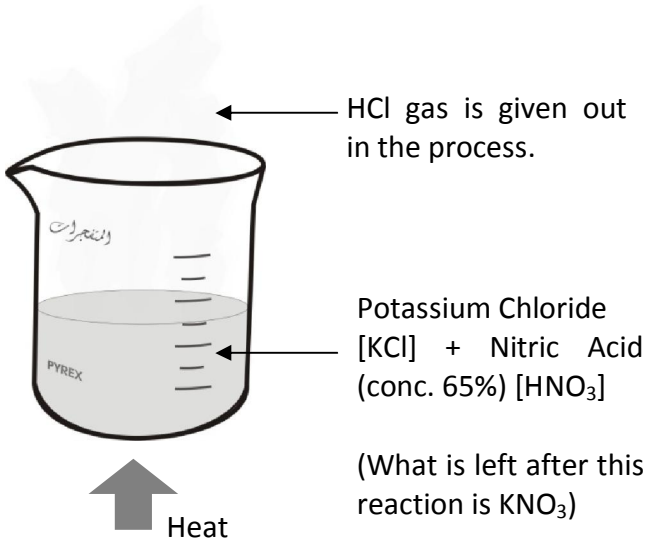
How To Prepare Potassium Nitrate

Potassium Chloride + Nitric Acid ⟶ Potassium Nitrate + Hydrochloric Acid

$KCl + HNO_3 \longrightarrow KNO_3 + HCl$

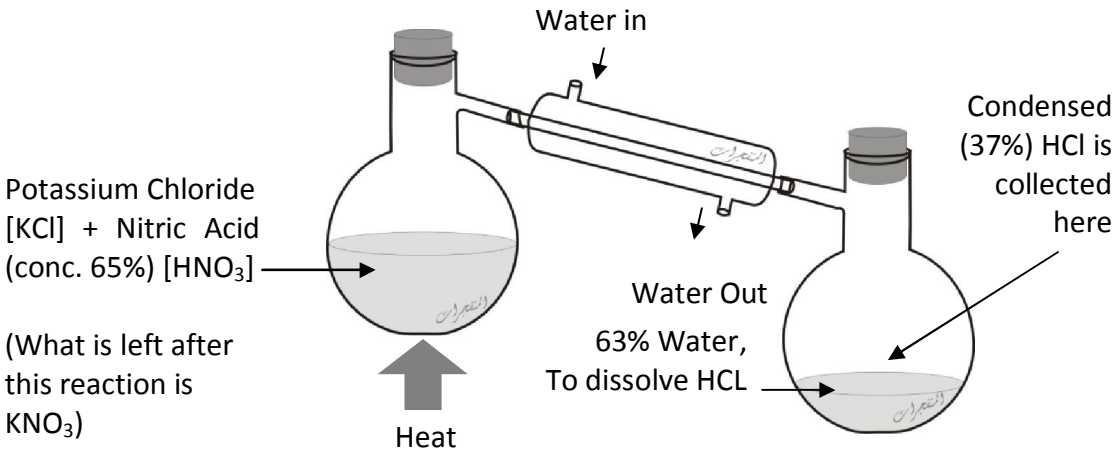
Method 1:

Put Potassium Chloride 74gr [KCl] to a beaker and put Nitric Acid63gr [HNO_3](conc. 65%) to it. Heating will emit Hydrochloric Acid (gas). After the gas is finished, a white powder [which is KNO_3] will be formed, dry it in sunlight.



If you want to collect the Hydrochloric Acid given off, you can use the following method: use the same ratios 1 [HNO_3]:1.7 [KCl]

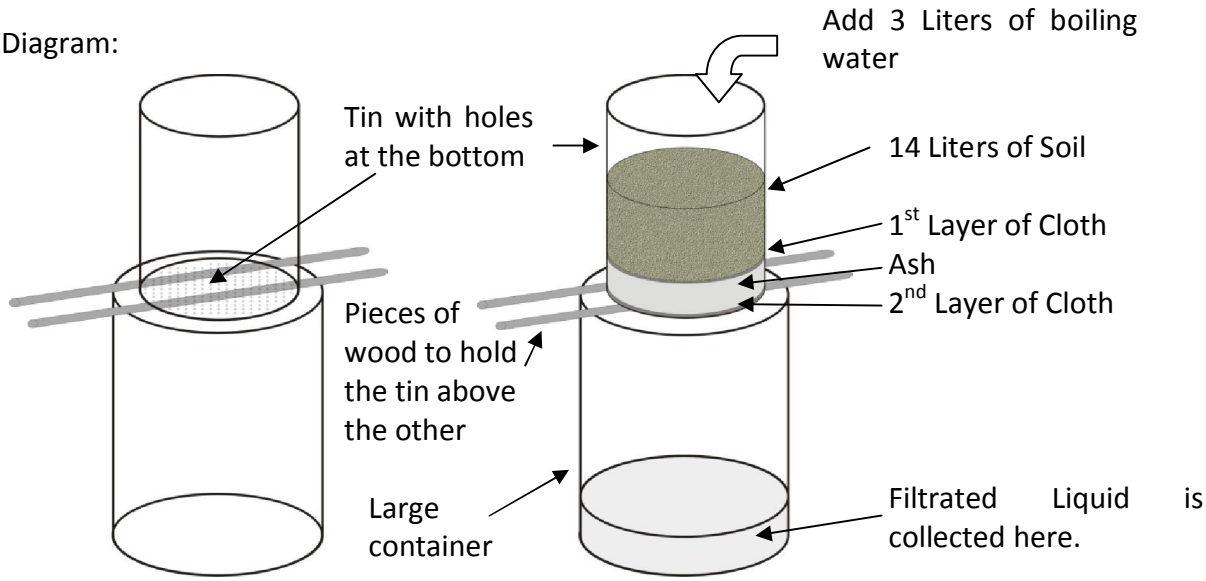
Method 2:



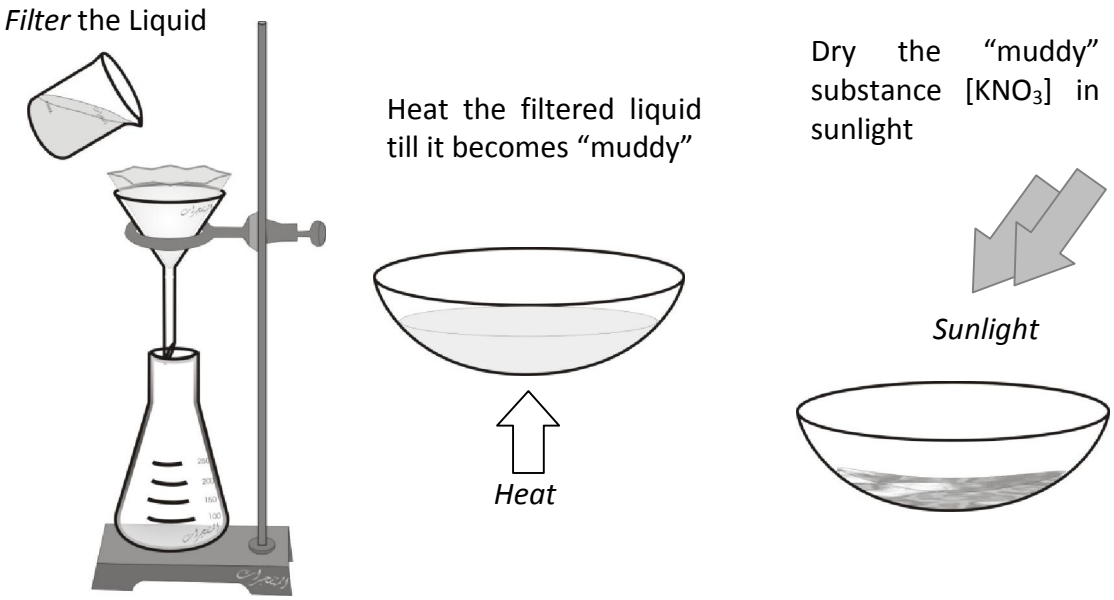
How to get Potassium Nitrate [KNO_3];

We can get it from agriculture lands or cemeteries or building lands, by the soils from these lands. And also from stools (dry) of sheep.

Diagram:



Then take the liquid and filtrate, and heat the liquid filtrated till it becomes like mud. Then dry in sunlight.



UREA NITRATE

How To Prepare Urea Nitrate

Urea + Nitric Acid ⟶ Urea Nitrate + Ammonia

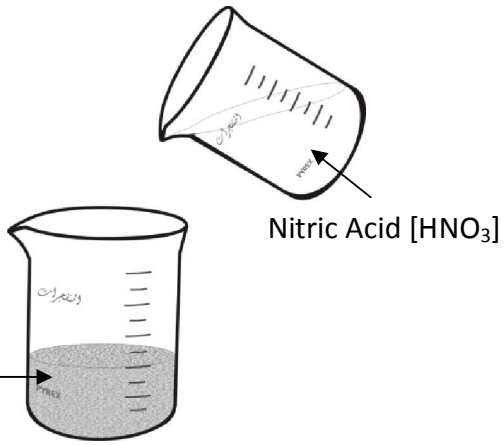
$CO(NH_2)_2 + HNO_3 \longrightarrow CO(NO_3)_2 + NH_3$

Method:

Pour excess Nitric Acid 126gr (conc. 65%) [HNO_3] to 60gr Urea [$CO(NH_2)_2$].

When it is dry Urea Nitrate is formed.

Urea [$CO(NH_2)_2$] in cold bath it is more better.



LEAD NITRATE

How To Prepare Lead Nitrate

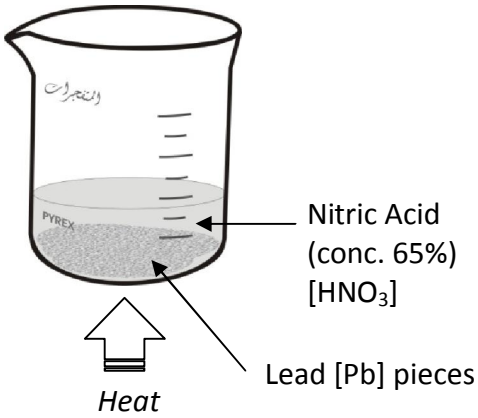
Lead + Nitric Acid ⟶ Lead Nitrate + Hydrogen gas

$Pb + HNO_3 \longrightarrow Pb(NO_3)_2 + H_2$

Put small pieces of Lead[23] [Pb]207gr to a container and put Nitric Acid [HNO_3]126gr (conc. 65%) to it and heat it. It will release a brown gas. Heat it till all the gas is finished. Then dry it in sunlight. If Lead [Pb]pieces are still remaining, you can add more Nitric acid [HNO_3] and repeat the process.

Diagram:

Heat in an open place, till all the gases are finished
It becomes a white greenish colour. Then dry it in sunlight.



[23] Lead [Pb] is easily available as (soft) solder which is used in soldering

SODIUM NITRATE

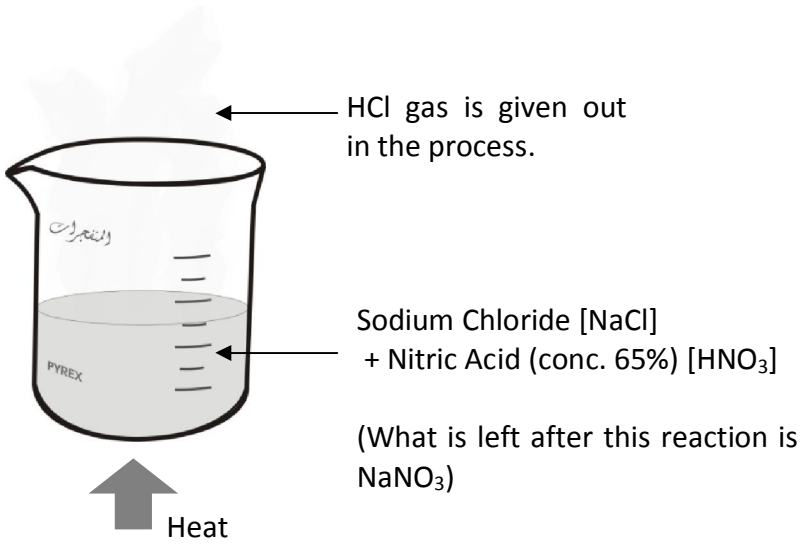
How To Prepare Sodium Nitrate

Sodium Chloride + Nitric Acid ⟶ Sodium Nitrate + Hydrochloric Acid

$NaCl + HNO_3 \longrightarrow NaNO_3 + HCl$

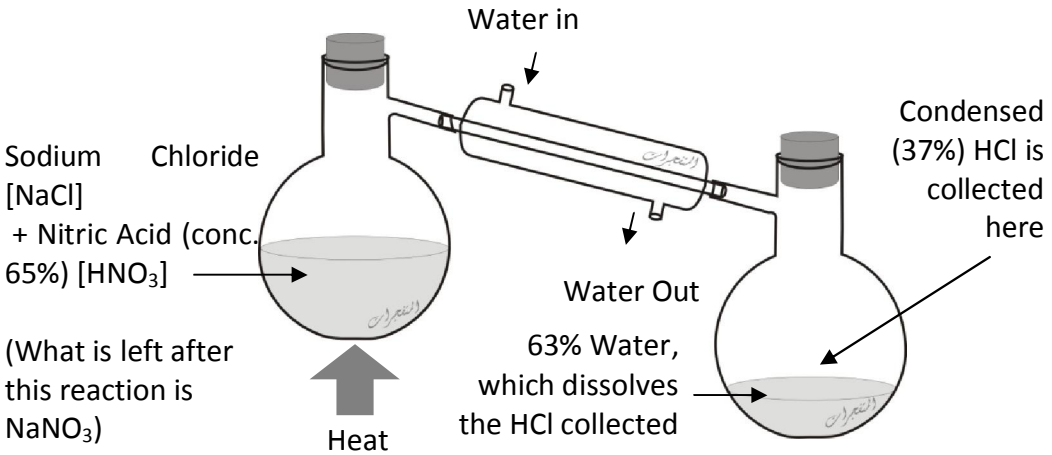
Method 1:

Put Sodium Chloride [24] [NaCl] 59gr to a beaker and put Nitric Acid [HNO_3]63gr (conc. 65%) to it. Heating will emit Hydrochloric Acid [HCl](gas). After the gas is finished, a white powder [which is $NaNO_3$] will be formed, dry it in sunlight.



If you want to collect the Hydrochloric Acid given off, you can use the following method:

Method 2:



[24] SodiumChloride is easily available as "Table salt" (common salt) used in seasoning of food

BARIUM NITRATE

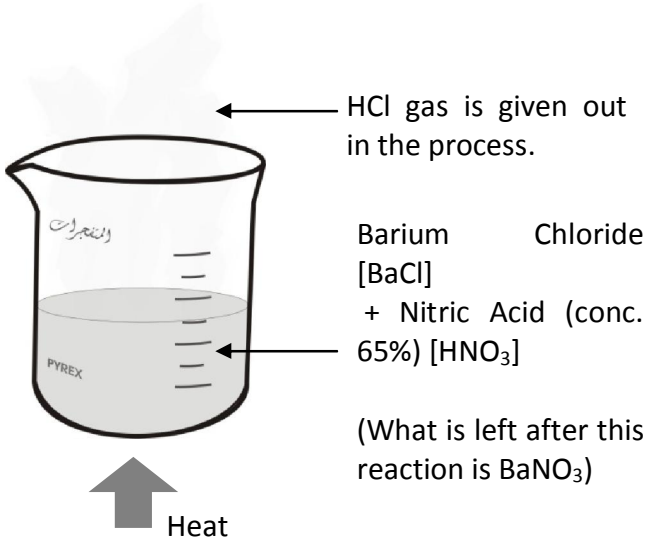
How To Prepare Barium Nitrate

Barium Chloride + Nitric Acid ⟶ Barium Nitrate + Hydrochloric Acid

$BaCl_2 + 2HNO_3 \longrightarrow Ba(NO_3)_2 + 2HCl$

Method 1:

Put Barium Chloride [BaCl] 209gr to a beaker and put Nitric Acid [HNO_3] 126gr to it. Heating will emit Hydrochloric Acid [HCl] (gas). After the gas is finished, a white powder will be formed, (which is $Ba(NO_3)_2$), dry it in sunlight.



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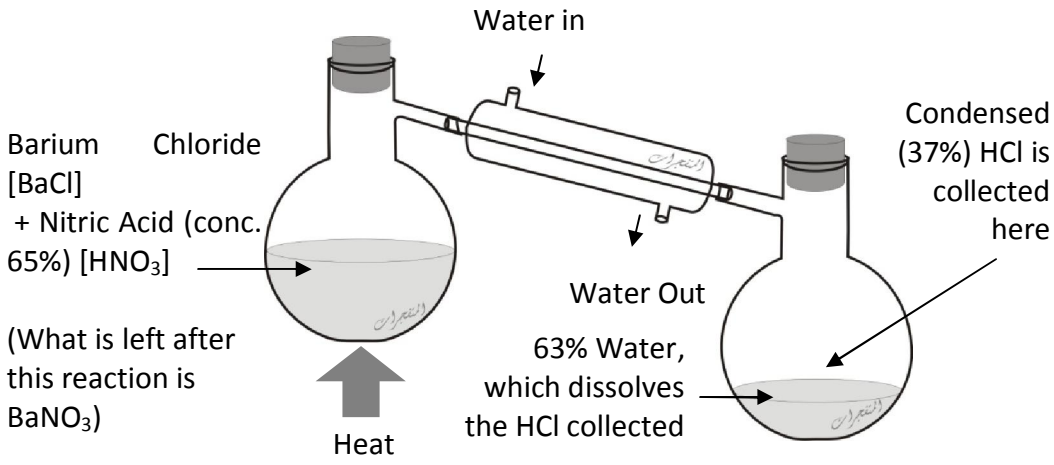


MIXTURES OF AMMONIUM NITRATE

#	Mixture	Ratio
1	Ammonium Nitrate (NH_4NO_3) Acetone peroxide ($C_6H_{12}O_4$) or ($C_9H_{18}O_6$)	96 8
2	Ammonium Nitrate (NH_4NO_3) Aluminium (Al)	96 8
3	Ammonium Nitrate (NH_4NO_3) Aluminium (Al) Charcoal (C_2H_6O)	90 5 5
4	Ammonium Nitrate (NH_4NO_3) TNT[$C_6HCH_3(NO_2)_3$]	40 60
5	Ammonite(used against tanks): Ammonium Nitrate (NH_4NO_3) Aluminium (Al) TNT[$C_6HCH_3(NO_2)_3$]	 65 20 15
6	Ammonium Nitrate (NH_4NO_3) Hexamine Peroxide ($C_6H_{12}O_6N_2$) Charcoal (C_2H_6O)	90 6 5
7	*Astrolite A* (the most powerful mixture): Ammonium Nitrate (NH_4NO_3) Hydrazine Hydrate (N_2H_5OH) Aluminium (Al)	 67 33 20
8	Ammonium Nitrate (NH_4NO_3) Aluminium (Al) Sulphur (S)	85 10 5
9	Ammonium Nitrate (NH_4NO_3) Wood powder/ Sugar/ Charcoal/ Oil/ Metal mixture (Metal mixture= engine oil + diesel or petrol in the ratio 1:1)Need a big detonator + small amount of Teteryl[25]or half sensitive explosive.	90 10
10	Ammonium Nitrate (NH_4NO_3) Red Phosphorous (P_4)	90 10
11	Ammonium Nitrate (NH_4NO_3) Aluminium (Al) Black Seed /Sulphur (S)	96 2 2

[25]Teteryl: Teterenitro methyl aniline, [$C_6H_2(NO_2)_4CH_3$], it is a yellow and reddish in coloured powder. It melts at 129.5^oC heat. It dissolves in water a little. But it dissolves completely in acids. It is a poison (lethal dose = 2g). You can store it in room temperature for many years.

MIXTURES OF UREA NITRATES

#	Mixtures	Ratio
1	Urea Nitrate [$CO(NO_3)_2$] Ammonium Nitrate (NH_4NO_3) Aluminium (Al) (do not store more than 3 days)	64 32 8
2	Urea Nitrate [$CO(NO_3)_2$] Aluminium (Al)	96 8
3	Urea Nitrate [$CO(NO_3)_2$] Aluminium (Al) Sulphur (S)	70 20 10
4	Urea Nitrate [$CO(NO_3)_2$] Charcoal (C_2H_6O) Sulphur (S) Aluminium (Al)	90 4 5 1

Note; after making mixtures of Urea Nitrate, keep it away from all other mixtures for one day –because it may fire or blast. After that you may use it.

MIXTURE OF LEAD NITRATE

#	Mixtures	Ratio
1	Lead Nitrate [$Pb(NO_3)_2$] Aluminium (Al)	96 8
2	Lead Nitrate [$Pb(NO_3)_2$] TNT[$C_6HCH_3(NO_2)_3$]	72 28
3	Lead Nitrate [$Pb(NO_3)_2$] Aluminium (Al) Sulphur (S)	85 10 5

MIXTURES OF SODIUM NITRATE

#	Mixtures	Ratio
1	Sodium Nitrate ($NaNO_3$) Aluminium [Al] or Phosphorous [P] or Black seed	85 15
2	Sodium Nitrate ($NaNO_3$) Aluminium (Al) Sulphur (S)	85 10 5

MIXTURE OF BARIUM NITRATE

#	Mixtures	Ratio
1	Barium Nitrate [Ba $(NO_3)_2$] Aluminium (Al) Sulphur (S)	56 28 14
2	Barium Nitrate [Ba $(NO_3)_2$] Aluminium (Al)	96 8

MIXTURES OF POTASSIUM NITRATE

#	Mixtures	Ratio
1	Black Powder(used in bullets): Potassium Nitrate (KNO_3) Charcoal (C_2H_6O) Sulphur (S)	 75 15 10
2	Potassium Nitrate (KNO_3) Sulphur (S)	85 15

2. POTASSIUM PERMANGANATE[26] [$KMnO_4$]

Properties
Violet color crystals, dissolved in water easily, give red color.

Uses Of Potassium Permanganate
Use to clean water from microbes and amoeba, also used for cleaning fruits and vegetables.

Safety
Be careful when grinding, because it may set alight (fire) or blast. And when you grind it, keep it far away from flame and glycerin.

Note: If its mixture is little (100gram or 200gram) then to get a good result with it, it must be blasted inside an iron container. However if the mixture is more than 50kg it will blast very well –without the need of an iron container (due to pressure).

MIXTURES OF POTASSIUM PERMANGANATE

#	Mixtures	Ratio
1	Potassium Permanganate ($KMnO_4$) Aluminium (Al)	60 40
2	Potassium Permanganate ($KMnO_4$) Sugar ($C_{12}H_{22}O_{11}$) Charcoal (C_2H_6O) Aluminium (Al)	75 5 5 5
3	Potassium Permanganate ($KMnO_4$) Wood powder ($C_6H_{10}O_5$) Aluminium (Al)	72 12 12

[26] In Urdu it is called *Surukh Potass*.

3. POTASSIUM CHLORATE[27] [$KClO_3$]

Properties

It is in the form of white crystals (salt), it dissolves in water, is not affected by humidity, though single drop of Sulphuric Acid [H_2SO_4] added to it creates sound, if it contains Sugar [$C_{12}H_{22}O_{11}$]it readily catches fire.

Uses

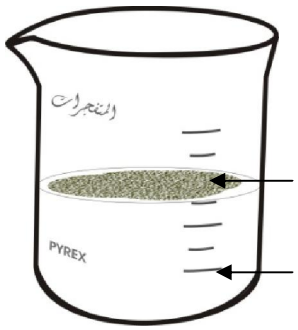
It is used in matches, fireworks, and explosives; also used as a disinfectant and bleaching agent.

Preparation of Potassium Chlorate[$KClO_3$] or Sodium Chlorate [$NaClO_3$]

Method 1:

Grind match heads and heat it for ½ an hour(till it dissolves in water).The Potassium Chlorate [$KClO_3$]in it will dissolve while Phosphorous [P] and Sulphur [S] which are also present will be left. Then filter the solution and take the liquid and again heat it till it becomes "muddy". After that, dry it in sunlight.

Step 1

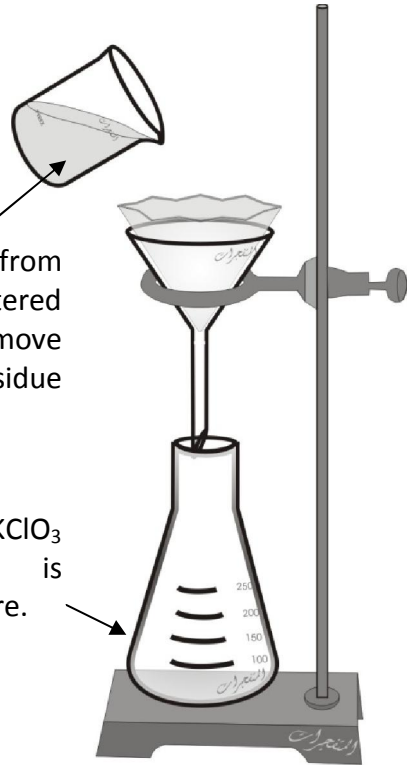


Grinded Match-heads

Heat

Heat is it for ½ an Hour

Step 2



The Solution from *Step 1,* is filtered to remove unwanted residue (phosphorus, sulphur etc.).

Filtrate ($KClO_3$ solution) is collected here.

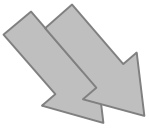
[27] *Sodium* Chlorate ($NaClO_3$) can be used as an alternative for *Potassium* Chlorate ($KClO_3$)

Step 3

Heat the filtrate from Step 2 till it becomes "muddy".

Heat

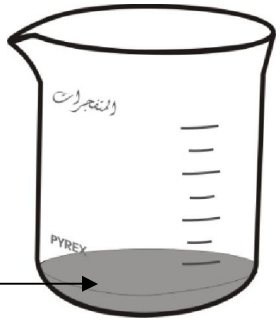
Step 4



Sunlight

Dry the "muddy" residue ($KClO_3$) from *Step 3* in sunlight.

"Muddy" liquid ($KClO_3$)

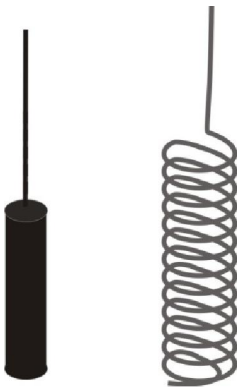


Method 2: (Electrolysis of Potassium Chloride*[28] *[KCl] or Sodium Chloride [NaCl])

Electrolysis: It is the *Lysis*(dissolution, disintegration) of a bond –produced by the passage of an electric current. Hence by electrolysis of Potassium Chloride [KCl] solution we are able to get a solution of Potassium Chlorate [$KClO_3$]:

1. For Electrolysis we need Direct Current [DC], so we have to change the normal house-hold Alternating Current [AC] to DC via an "AC to DC" converter.
2. The Positive [+] end of DC is connected to a element, which is denoted as Anode. And the Negative [⁻] end of DC is connected to another element, which is denoted as Cathode. Hence Anode carries the Positive [+] charge and Cathode carries the Negative [⁻] charge.
3. The Anode we use is a Carbon rod. And as a Cathode we use a spiral stainless steel coil. As the experiment is carried out the Carbon Rod dissolves away and maybe needed to replace. However the (Stainless Steel) Cathode is non-corrosive.

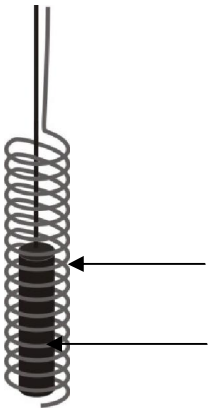
Carbon rod Anode [+] (Small carbon rods maybe extracted from inside Batteries)



Spiral coil shaped stainless steel Cathode [⁻]

[28]In *Urdu*Potassium chloride is called *Safeyd Potass*.

4. The Voltage [V] required for this is 3.5 to 4.0 V. And the Current or Ampere required is 2 A per 100ml of the Solution. Hence we have to adjust this to the required amount. You can adjust the ampere by widening and narrowing Spiral Coil. If it becomes wider it increases the ampere. As we are using 200ml Solution we need at least 4A current.



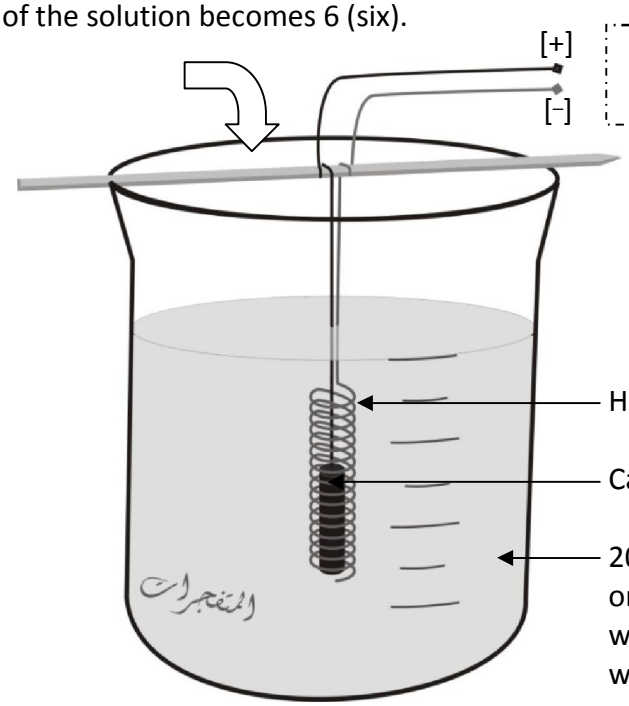
Adjust ampere by widening and narrowing heater (spiral coil). If it becomes wider it increase ampere.

(Outside) Spiral Coil [steel] Cathode

(Inside) Carbon Anode

5. Before starting the process you should add Hydrochloric Acid [HCl] or Sulphuric Acid [H_2SO_4] till the pH of the solution becomes 6 (six).

Add *Hydrochloric Acid* [HCl] or *Sulphuric Acid* [H_2SO_4] till the pH of the solution becomes 6 (six).



For electrolysis Direct Current [DC] is required, you can convert house hold power (which is AC) to DC by an AC to DC converter

Heater (spiral stainless steel) Cathode [–ve]

Carbon (rod) Anode [+ ve]

200ml Solution of Potassium Chloride [KCl] or Sodium Chloride [NaCl] (Since for 100ml we need 2 Ampere, for this 200ml solution we should have a current of 4 Ampere)

6. The electrolysis should be carried on for 32hours (continuously or not)
7. Filter the solution after completing 32 hours.
8. Now heat the filtered solution till it becomes “muddy”
9. Then dry it in Sunlight.

MIXTURES OF POTASSIUM CHLORATE

#	Mixtures	Ratio
1	Potassium Chlorate [$KClO_3$] Sulphur [S]	85 15
2	Potassium Chlorate [$KClO_3$] Vaseline [$C_{12}H_{32}$] / Engine Oil/ Cooking Oil	88 12
3	Potassium Chlorate [$KClO_3$] Sugar[$C_{12}H_{22}O_{11}$]	90 10
4	Potassium Chlorate [$KClO_3$] Sulphur [S] TNT[$C_6HCH_3(NO_2)_3$] Aluminium Powder [Al]	60 10 10 10
5	Silver Powder(will blast by impact): Potassium Chlorate [$KClO_3$] Sulphur [S] Aluminium Powder [Al]	 52 26 26
6	Potassium Chlorate [$KClO_3$] Honey	80 6
7	Potassium Chlorate [$KClO_3$] Black Seed	90 10
8	Potassium Chlorate [$KClO_3$] Nitro Benzene[$C_6H_5NO_2$] (Powerful than TNT, breaks Iron, can be used against tankers)	80 l 84 20 l 14
9	Potassium Chlorate [$KClO_3$] Sugar[$C_{12}H_{22}O_{11}$] Sulphur [S]	2 (by volume) 1 (by volume) 1 (by volume)
10	Potassium Chlorate [$KClO_3$] TNT[$C_6HCH_3(NO_2)_3$] Sugar[$C_{12}H_{22}O_{11}$] Aluminium Powder [Al]	70 20 5 15
11	*The Fidāī* Mixture: Potassium Chlorate [$KClO_3$] Diesel Wood Powder($C_6H_{10}O_5$)	 88 8 3.5
12	Potassium Chlorate [$KClO_3$] Sand [SiO_2] Sulphur [S]	70 20 10
13	Potassium Chlorate [$KClO_3$] Tar (*Zift*) (Mix *Tar* with petrol until it dissolves. Then mix it with $KClO_3$ and dry in sunlight.)	84 16
14	Potassium Chlorate [$KClO_3$] Charcoal [C_2H_6O] Sulphur [S]	84 12 12

4. HYDROGEN PEROXIDE

Properties:
Colourless liquid, boiling point is 150^{o}C. It smells little like Nitric Acid. It can mix with water by any ratio. It is available in medical store with the ratio 3 to 6 to water. Then we can concentrate it by heating on flame.

Safety:
Take care from gases coming from it during concentration. You must use gloves, glasses and masks. If even one drop touches body wash by large quantity of water or Sodium Carbonate [Na_2CO_3] solution. Also after making the mixtures of Hydrogen Peroxide [H_2O_2] (except the mixtures of it with Acetone[C_3H_6O]) keep them in an open container for ½ an hour.

Note: When mixing Hydrogen Peroxide [H_2O_2], keep all materials and elements clean, if any dirt is present, it might set alight (fire).

How to Get Hydrogen Peroxide [H_2O_2]

We can get it from any medical store. Concentrated or diluted. We can also prepare it using Sodium Carbonate [Na_2CO_3]:

Step 1

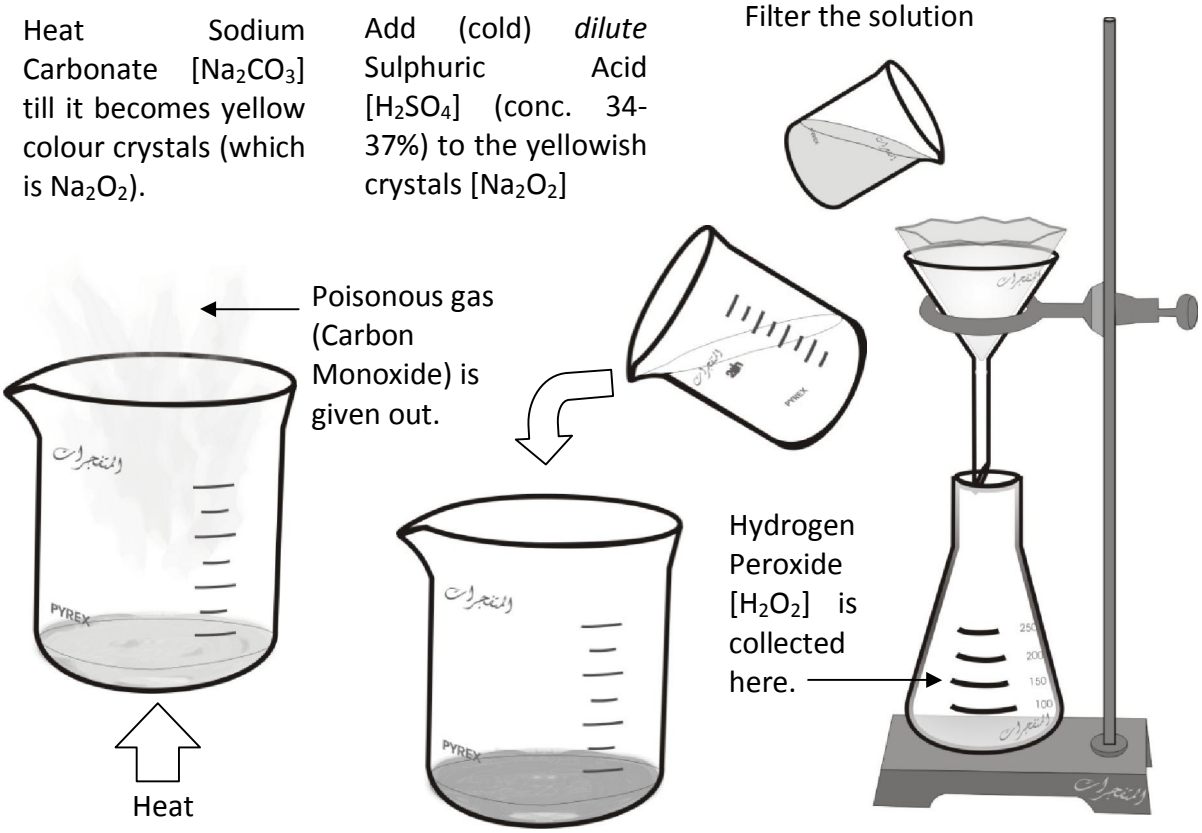
Heat Sodium Carbonate [Na_2CO_3] till it becomes yellow colour crystals (which is Na_2O_2).

Step 2

Add (cold) *dilute* Sulphuric Acid [H_2SO_4] (conc. 34-37%) to the yellowish crystals [Na_2O_2]

Step 3

Filter the solution



Note: Remember the Sulphuric Acid we use here is *dilute*, with conc. between 34 -37%

MIXTURES OF HYDROGEN PEROXIDE

#	Mixtures	Ratio
1	Hydrogen Peroxide [H_2O_2] Wheat/ Black Seed/ Black Pepper/ Red Pepper/ Rice Powder (4:1 ratio is the most powerful)	2 l 3 l 4 1 l 1 l 1
2	Hydrogen Peroxide [H_2O_2] Acetone [C_3H_6O] (Prepare in a bottle and keep it always closed)	78 26
3	Hydrogen Peroxide [H_2O_2] Honey Acetone [C_3H_6O]	78 18 18
4	Hydrogen Peroxide [H_2O_2] Sand[SiO_2] Aluminium Powder [Al]	36 30 6
5	Hydrogen Peroxide [H_2O_2] Sugar[$C_{12}H_{22}O_{11}$] (In hot weather this mixture will catch fire after 3 days, if it is cold 7days.)	3 l 4 1 l 1

MOST POWERFUL 19 MIXTURES

#	Mixtures	Ratio
1	Ammonium Nitrate [NH_4NO_3] Hydrazine Hydrate [N_2H_5OH] Aluminium Powder [Al]	67 33 20
2	Hydrogen Peroxide [H_2O_2] Wheat/ Sugar[$C_{12}H_{22}O_{11}$]	4 1
3	Urea Nitrate [$CO(NO_3)_2$] Ammonium Nitrate [NH_4NO_3] Aluminium Powder [Al]	32 16 4
4	Lead Nitrate [$Pb(NO_3)_2$] Aluminium Powder [Al]	12 1
5	Potassium Chlorate [$KClO_3$] Sugar[$C_{12}H_{22}O_{11}$] Sulphur [S]	2 (by volume) 1 (by volume) 1 (by volume)
6	Potassium Chlorate [$KClO_3$] Diesel Wood Powder($C_6H_{10}O_5$)	88 8 3.5
7	Potassium Chlorate [$KClO_3$] Nitro Benzene[$C_6H_5NO_2$]	4 l 6 1 l 1
8	Ammonium Nitrate [NH_4NO_3] Charcoal [C_2H_6O] Aluminium Powder [Al]	90 5 5
9	Ammonium Nitrate [NH_4NO_3] TNT[$C_6HCH_3(NO_2)_3$] Aluminium Powder [Al]	65 15 20
10	Ammonium Nitrate [NH_4NO_3] Acetone (di or tri -cyclo) Peroxide	12 1
11	Ammonium Nitrate [NH_4NO_3] Black Seed Aluminium Powder [Al]	48 1 1
12	Ammonium Nitrate [NH_4NO_3] Aluminium Powder [Al]	12 1
13	Urea Nitrate [$CO(NO_3)_2$] Aluminium Powder	12 1
14	Potassium Chlorate [$KClO_3$] Vaseline [$C_{12}H_{32}$] Sulphur [S]	6 1 1
15	Potassium Chlorate [$KClO_3$] Metal Mixture (Metal Mixture: Engine Oil + diesel or Petrol, mixed in 1:1 ration)	90 10

16	Potassium Chlorate [$KClO_3$] TNT[$C_6HCH_3(NO_2)_3$] Aluminium Powder [Al] Sugar[$C_{12}H_{22}O_{11}$]	35 10 7.5 2.5
17	Potassium Chlorate [$KClO_3$] Vaseline [$C_{12}H_{32}$]	88 12
18	Potassium Chlorate [$KClO_3$] Sulphur[S] Engine Oil	6 0.5 0.5
19	Ammonium Nitrate [NH_4NO_3] Red Phosphorous [P_4]	90 10

Explosive Compounds

Nitro Glycerin

Properties:
White liquid, when left for 1 or 2 days it becomes color less, and color less is more powerful. Should store in Water with ratio is 3:1. Its density is 1.59g/cm^3. It does not dissolve in Water but dissolves in Organic solvents, olive oil, Sulphuric Acids [H_2SO_4] and Nitric acids [HNO_3]. Blasting speed is 8000 – 9292m/s. Temperature for blasting is 180^oC. Though Nitro glycerin can be stored in freezer its dynamite explodes in it.

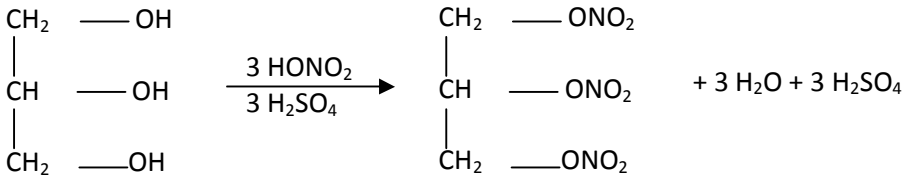
Uses of nitro glycerin:
For making dynamite, blasting mixtures and also as a poison [29]

Preparation of nitro glycerin

1. Pour 15ml of Nitric Acid (65 -75% concentration) [HNO_3] to a beaker.
2. Pour 22.5ml of Sulphuric Acid (98% concentration) [H_2SO_4] to a beaker, and pour Sulphuric acid [H_2SO_4] to Nitric Acid [HNO_3] slowly.
3. The temperature should be less than 30^oC
4. Keep the beaker in a water bath, and pour 5ml of Glycerin to beaker, drop by drop.
5. Stir it for 5minutes and the pour it to 250ml of water.
6. At the bottom, will have white jelly like substance, take it using dropper.
7. Then pour Sodium Carbonate [Na_2CO_3] to it until it becomes Neutral (ph 7).
8. Then make dynamite using it or store under water.

Reaction of glycerin with nitric acid:

$$C_3H_5(OH)_3 + 3HNO_3 \xrightarrow{H_2SO_4} C_3H_5(ONO_2)_3 + 3H_2O$$



Glycerin *$HONO_2$ (i.e. HNO_3)* *Nitro Glycerin*

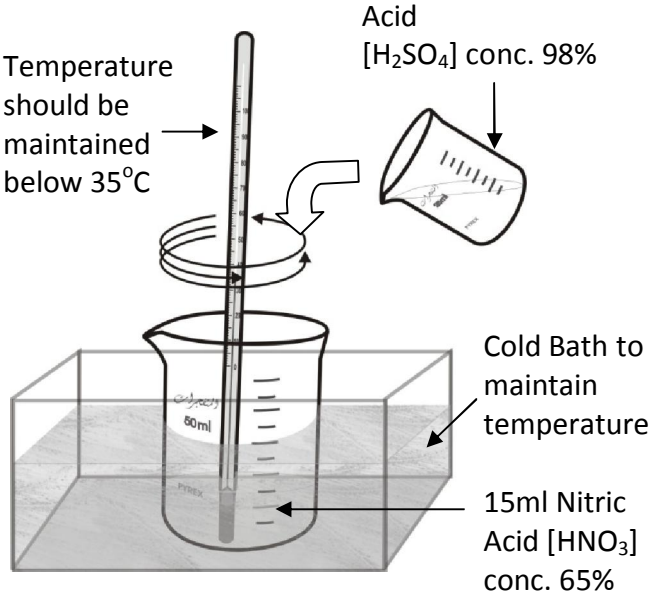
**Sulphuric Acid [H_2SO_4] is used as a catalyst, which absorbs water molecules [H_2O].*

---

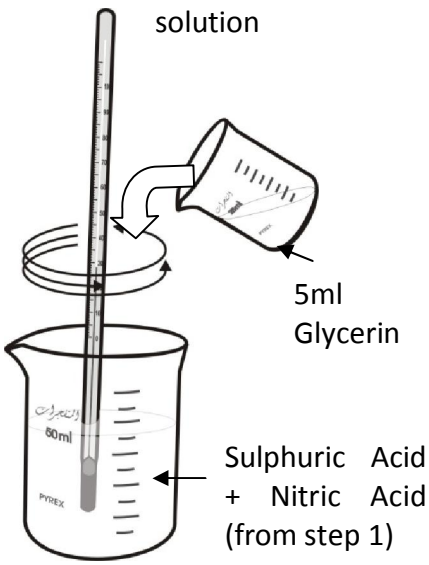
[29] Note: Nitro glycerin is a very high poison. 1ml can kill anyone within 1 – 2 hours; because it causes low pressure. It has a sweet taste, so can be used in sweets or juices.

Preparation of Nitro Glycerin in Diagram

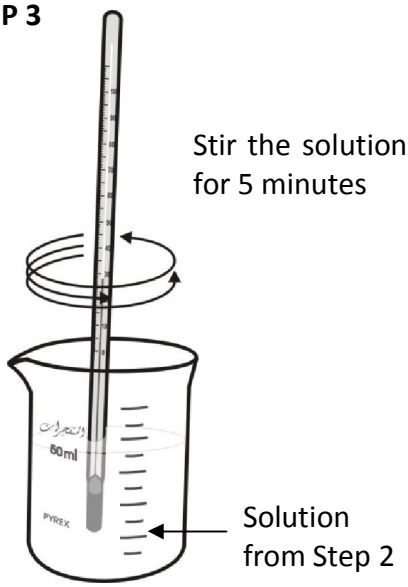
STEP 1



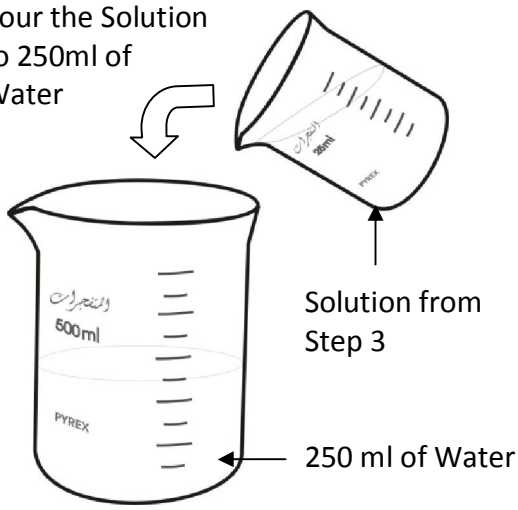
STEP 2



STEP 3



STEP 4



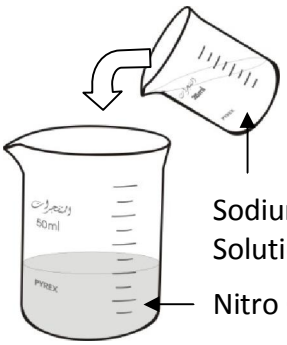
STEP 5

A white jelly like liquid will be formed. Use a dropper to take the liquid.

STEP 6

Pour Sodium Carbonate [Na_2CO_3] Solution to the liquid Nitro Glycerin (Collected from Step 5) till the pH becomes Neutral (pH 7). Then take out the Nitro Glycerin (which is a White Colour liquid).

White jelly like liquid (Nitro Glycerin)



Sodium Carbonate Solution [Na_2CO_3]

Nitro Glycerin

Then make dynamite using it or store under water in freezer. Also this is one of the strong poisons that can be used as touch poison, if it is mixed in olive oil, or even with food like chocolates and cakes as it has a sweet taste.

PREPARATION OF YOUR OWN IDEAL MIXTURES

How To Find Out Whether An Element Is Oxidizing Or Reducing:

2 x No. of Carbon atoms in the compound + ½ of the No. of Hydrogen atoms in it compared with No. of Oxygen atoms in it. If both are equal or Oxygen is more than it, it is an Oxidizing Agent. If Oxygen is less, then it is a Reducing Agent.

Example of an Oxidizing Agent: $KClO_3$

2 x 0 (No. of Carbon atoms) + ½ x 0 (No. of Hydrogen atoms) compared with 3 Oxygen.
0 < 3 So, this is an Oxidizing Agent.

Example of a Reducing Agent: Sugar [$C_{12}H_{22}O_{11}$]

2 x 12 + ½ x 22 : 11

24 + 11 : 11

35 > 11,

35 is greater than 11, thus this is a Reducing Agent.

How to Find the Best Ratio for a Mixture Theoretically:

1. Balancing Equations

Example:

$$NH_4NO_3 + Al \longrightarrow Al_2O_3 + N_2 + H_2O + Heat$$

This Equation depicts an Explosive Reaction between Two Substances resulting in some Chemical Reaction producing Large Amounts of Heat, the Equation in its present form just shows the substances that reacted and the products produced. To use this Equation for finding out the Quantities that should be mixed together (ratio in which both substances are to be mixed), we need to balance the equation such that the No. of Atoms of a Particular Element on one side of the Equation should be equal to the No. of Atoms of the Same Elements on the Other Side of the Equation. Eg: We balance the above Equation in the following manner:

$$3NH_4NO_3 + 2Al \longrightarrow Al_2O_3 + 3N_2 + 6H_2O + Heat$$

Now the No. of Atoms of each Element on both sides of the Equation is same. And thus the Equation is balanced. Now we can use it for finding out the Quantities of Substances used.

***2. Finding the Ratio by Mass*:**

- Find the Atomic Mass used in the Balanced Equation.
- Divide the Greater Mass with the lesser ones.
- Take the result of Division as Mass of the Substance having Greater Mass, and take 1 as the Mass of the Substance having the Lesser Mass.

Example: The *balanced* equation for the reaction between Ammonium Nitrate and Aluminium is as below:

$$3NH_4NO_3 + 2Al \longrightarrow Al_2O_3 + 3N_2 + 6H_2O + Heat$$

The atomic mass of Ammonium Nitrate and Aluminium in this balanced equation is:

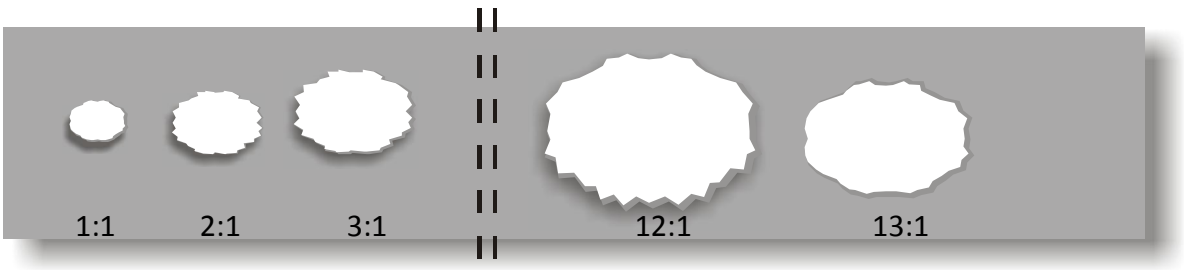
3 [N	H_4 N	O_3] +	2 Al
3[14 + (1 x 4) + 14 + (16 x 3)]		:	2 x 27
=	240	:	54
=	4.4	:	1

This means that for every 4.4 Ammonium Nitrate [NH_4NO_3] reacts successfully with 1 Aluminium [Al] particle. Hence the ratio is as 4.4 : 1

And if you want to increase this, for example double [x2] its power, then multiply both sides by 2. Hence then, the ratio will be 8.8 : 2 etc.

How to Find the Best Ratio for a Mixture Practically

The other method of finding out the ratio in which both substances should be mixed is by experimenting by practically taking together both substances in different ratios and seeing which ratio gives the best explosion. Then select this ratio as the ideal one by experiment and past experience.



Ratio = [Oxidizing : Reducing]

The Oxidizing and Reducing Agents are mixed in different ratios. These samples of mass 100g each, are blasted on an Iron plate. As shown in the example, the result is calculated by observing the optimum destruction. So in the example (above) the best ratio is 12:1

PART THREE: Section Three

iii. MANUFACTURE OF LAUNCHING CHARGE

iii. LAUNCHING CHARGE

NITROCELLULOSE

Properties Of Nitrocellulose

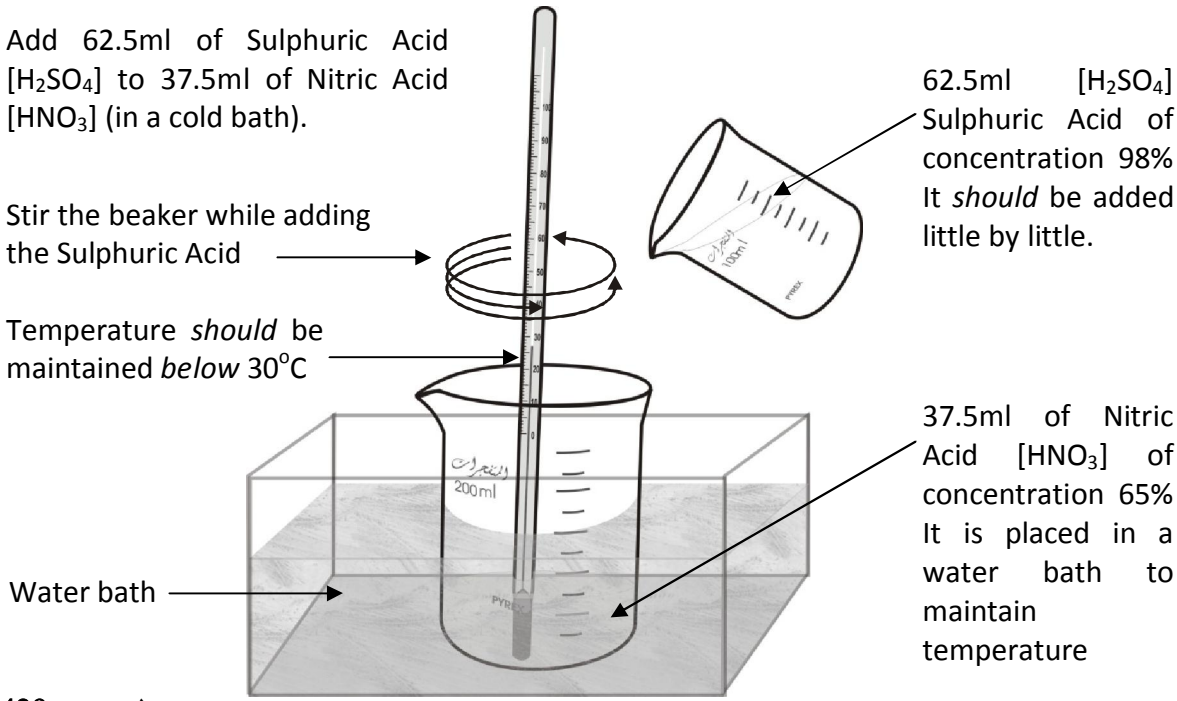
Shape like usual cotton. Density is 1.65g/cm^3. Sensitivity for impact is zero, very sensitive for temperature and electrical spark and fire. It must be stored inside dark room.

Preparing Nitrocellulose

1. Pour 37.5ml of Nitric Acid [HNO_3] (65% concentrated) to a beaker 1; keep the beaker in a cold water bath.
2. Pour 62.5ml of Sulphuric Acid [H_2SO_4] (98% concentration) to a beaker: 2.
3. Pour Sulphuric Acid [H_2SO_4] to Nitric Acid [HNO_3] slowly. Bit by bit, the temperature should be below 30^{o}C the best is 5 to 10^{o}C, stir the beaker when pouring.
4. After all Sulphuric Acid [H_2SO_4] is poured to Nitric Acid [HNO_3], lover the temperature as much as possible. Put 7.5gram of cotton to the beaker of the [Nitric Acid + Sulphuric Acid]. Drop all cottons at once.
5. When the cottons are fully wet, take it quickly, after pressing.
6. Drop the cottons to a large container of water. Then the cottons after pressing put it to a plate with water to heat it for 20 minutes.
7. After heating, pour Sodium Carbonate [Na_2CO_3] solution to it, till the pH is 7
8. After pH is 7, take the cottons and dry it in sunlight.

Preparation of Nitrocellulose in Diagram:

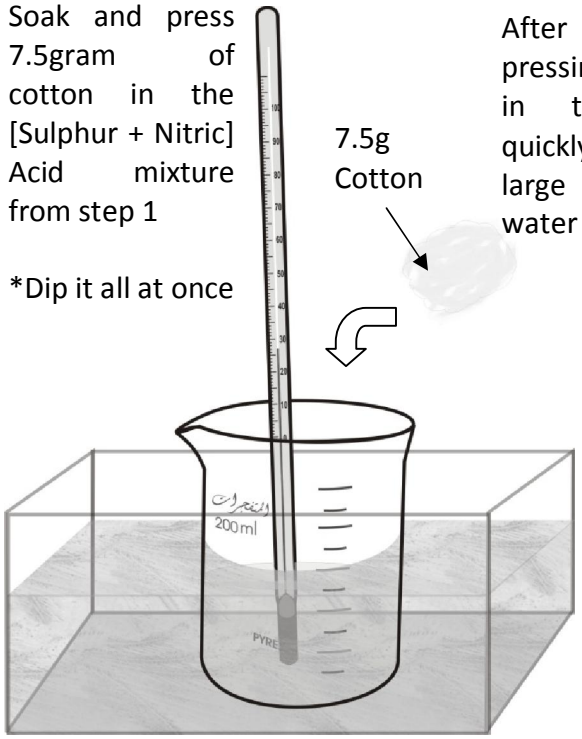
Step 1



Step 2 and 3

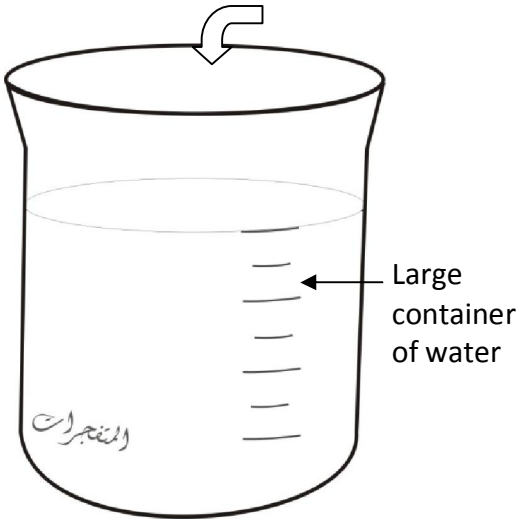
Soak and press 7.5gram of cotton in the [Sulphur + Nitric] Acid mixture from step 1

*Dip it all at once



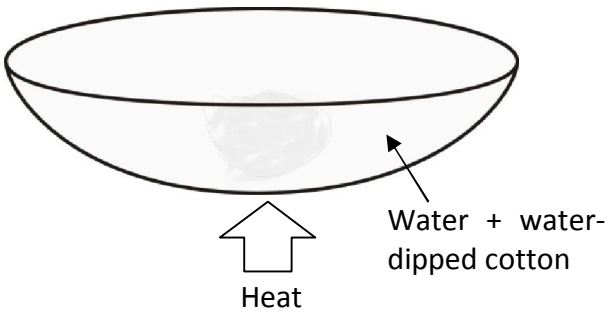
After soaking and pressing the cotton in the acid-mix, quickly dip it in to a large container of water

Press the soaked cotton in water



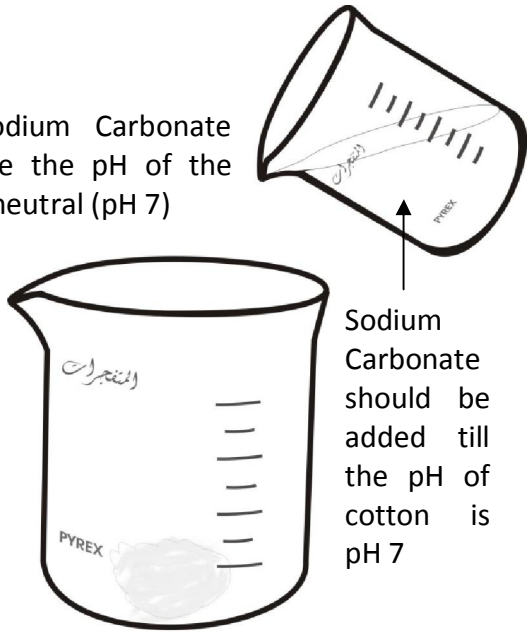
Step 4

Heat the water dipped cotton in water from step3, for 20 minutes



Step 5

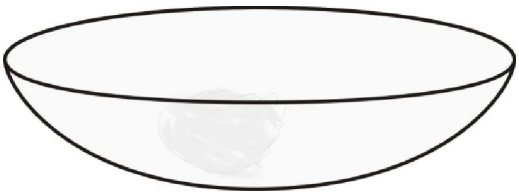
Add Sodium Carbonate to make the pH of the cotton neutral (pH 7)



Step 6

Dry the cotton (Nitro Cellulose) in sunlight

Sunlight



Mixture for Nitrocellulose Strip and Stick:

- Nitrocellulose *Strips* is used in RPG Launcher, it consists of:

  1 gram Nitro cellulose + 7gram of Acetone

- Nitrocellulose *Sticks* are used in the rocket BM12, it consists of:

  1gram Nitro cellulose + 7 gram Acetone + any Fuel (used for making fuse [30]).

Note: Here the Fuel should weigh a total mass equivalent to [½ of acetone + Nitro Cellulose]which in this case is 4 grams.

After mixing these things you should quickly apply it into the caster for strips or sticks.

Nitrocellulose Jacket

We can use Nitrocellulose in Martyrdom Jacket[31]. First spread the cottons of Nitrocellulose inside the jacket and put some drops of Nitro Glycerin to the cotton randomly. Dissolve Dicyclo Acetone Peroxide in Acetone and apply it on the outside of the jacket –this is used as the detonator. The jacket will now blast by impacting or firing.

[30]Like "black powder", *Silverish* explosive mixtures etc. For details on fuel mixtures *see* p.56
[31] Details on *Martyrdom* Jackets will be taught in the "Preparation Course".

PART THREE: Section Four

iv. MANUFACTURE OF HIGH TEMPERATURE EXPLOSIVES

iv. HIGH TEMPERATURE EXPLOSIVES

Definition:

This is the explosive in which burning, lighting and smoking is more than the property of blasting.

High Temperature Explosives:

a. **Burning:**
    i. Thermite Bomb
    ii. Moltoaf Bomb
    iii. Napalm Bomb
    iv. Sodium Bomb
    v. Slow Burning Bomb
    vi. Fast Burning Bomb

b. **Lighting Bomb**
c. **Smoke Bomb**

a. BURNING:

i. THERMIT BOMB:

This is a mixture having very high temperature (from 2300- 2700^{o}C), so it can melt even iron.

Idea of this bomb:
Aluminium used in this is a very reactive metal. It can replace any Iron [Fe]or its oxide. This action gives off high temperature which melts any Iron[32].

If we use a container of plastic or open metal container there will be a little sound. We can use this to melt anything made of metal or Iron [Fe], such as tanks, money safes etc.If we use a good closed container and a detonator to blast, it will evaporate all metals surrounding it. In this Thermite bomb, smoke is very less and it has a smell of burning potato.

How To Make Thermit Bomb

Mixture of:

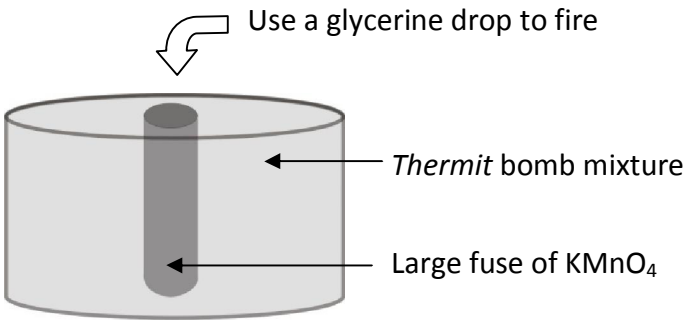
40g of Iron Oxide [FeO] (Rust in black colour)
or 54g of Ferric Oxide [Fe_3O_4] (Rust in brown colour)

+ 13.4g Aluminium Powder

+ 5g Engine Oil

+ 5g Barium Oxide [BaO] or Barium Nitrate [$BaNO_3$] or Potassium Chlorate [$KClO_3$] or Ammonium Nitrate [NH_4NO_3]

To burn it: We can use a large fuse of Potassium Permanganate [$KMnO_4$] to fire it using a drop of Glycerine.



*You can use any type of good container to place the mixture.

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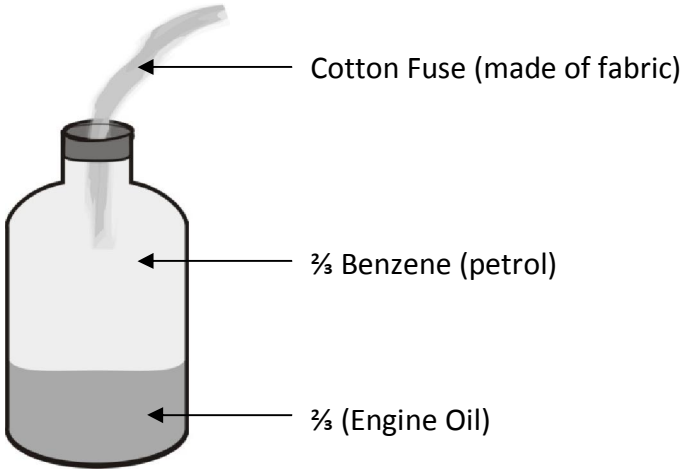
[32] 2kg of it is enough to burn a jeep

ii. MOLTOAF BOMB:

The old Moltoaf bomb was made by a bottle:



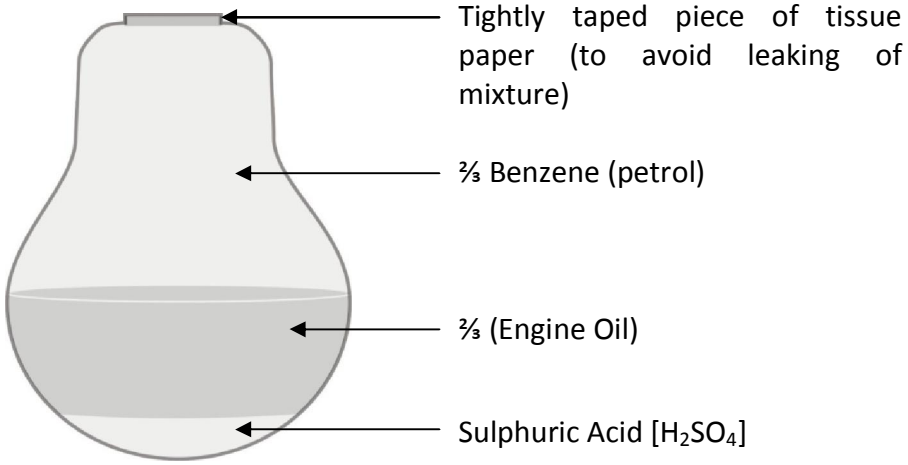
Disadvantage of old Moltoaf bomb:

- It can hurt the thrower by its fire
- Can see the place of thrower –so it is easy for enemy to harm the thrower

New (modified) Moltoaf bomb:

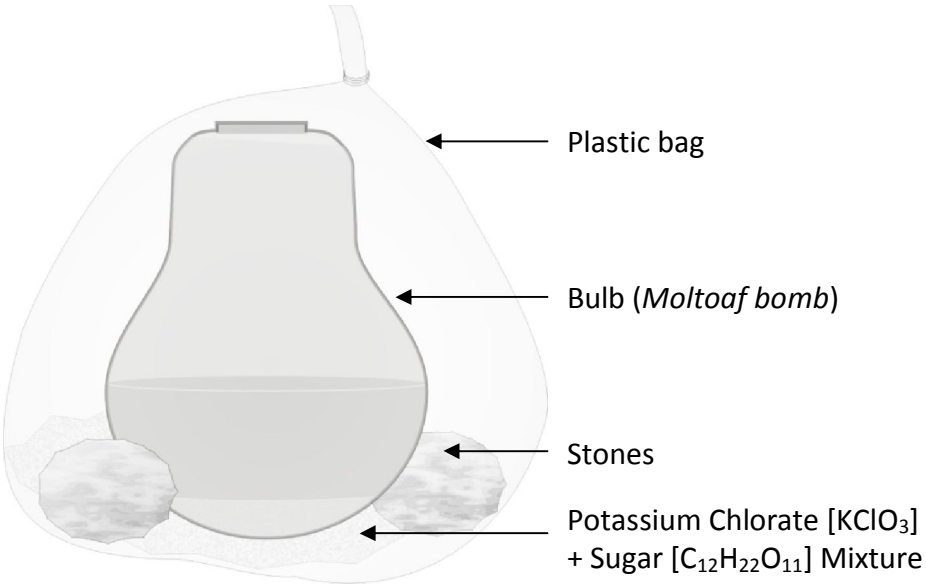
This is made by a bulb; you can remove the cap of bulb and make a hole from the top of the bulb and fill it as below:

Diagram



- Cover the top tightly using tape
- Dry the outer side of the bulb *properly*–because if any Sulphuric Acid remains outside, it will catch fire.
- Then put to a plastic bag with potassium chlorate + sugar mixture.

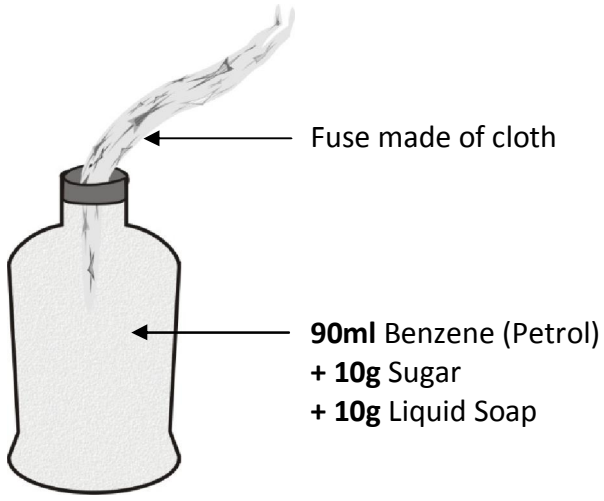
Diagram



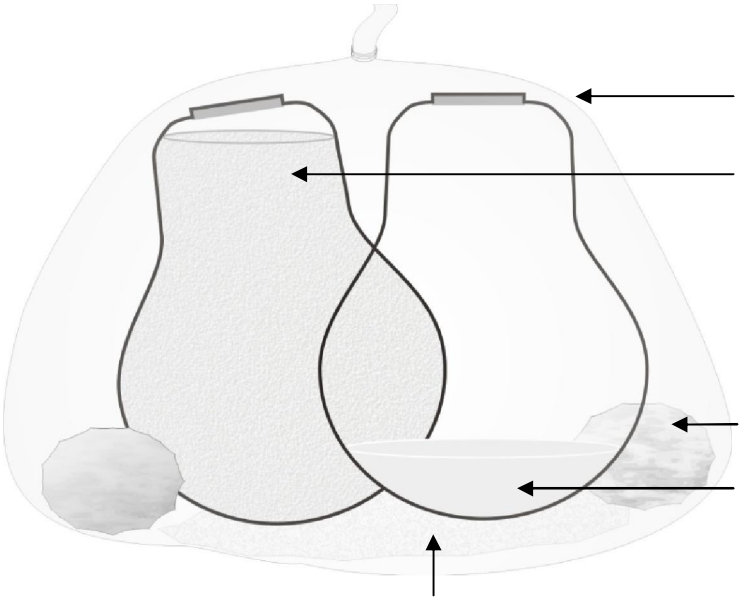
- Then tight the plastic bag and throw to enemy
- It will fire itself when it hits the target –because breaking the bulb will cause Sulphuric Acid to react with Potassium Chlorate +Sugar mixture which will fire
- Then other mixtures increases the fire to a temperature of $2000^{O}C$
- No blasting, no any sound only fire.

iii. NAPALM BOMB:

Old Method Diagram



New Method Diagram



It has temperature to 2000^{o}C. And flame for long time. And anyone who is affected by this bomb will be killed due to entering fire inside bones. And in a short time he will be killed.

How To Improve Napalm Bomb

1. *Phosphorus Napalm Bomb*

   Its temperature is more than2000^{o}C. It is made up of; 1kg Napalm mixture + 1kg white or yellow phosphorous. Phosphorus releases a very “good” smelling gas, which breaks bones and eyes.

2. *Oxygenic Napalm Bomb*

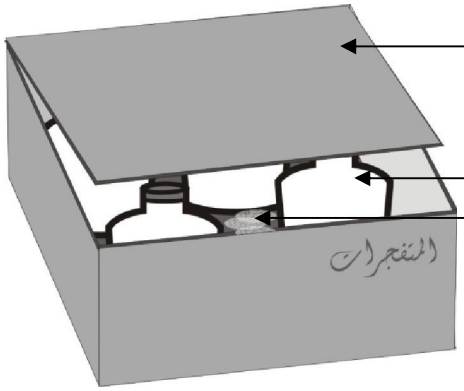
   1kg Napalm mixture + 1kg Hydrogen peroxide (H_2O_2) 45% concentration.

3. *Glatenic Napalm bomb.*

   1kg Napalm mixture + 1kg Potassium Hydro Sulphate ($KHSO_4$)

iv. SODIUM BOMB:

Diagram:



Iron or metal container (very light)
Or a plastic container

Glass bottles (of water)

Sodium Metal

[Ratio = 1.5 Water: 1 Sodium]

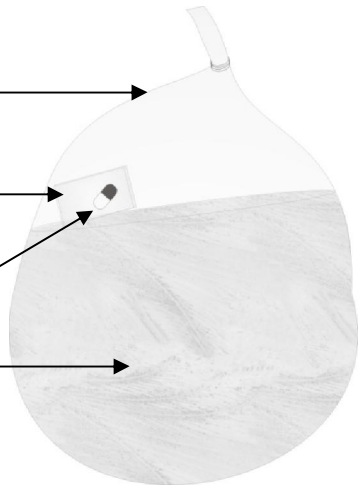
It is also fired by throwing, when sodium metal contacts with water it will blast.

After burning, it will give NaOH concentrated solution. Very high temperature about 1500^{o}C.If effected to eyes or body it will be finished.

v. SLOW BURNING BOMB:

Ratio ; 2 volume Wood powder [$C_6H_{10}O_5$] : 1 volume Wax [$CH_3(CH_2)_{14}C(CH_2)_{29}\ CH_3$].

***Preparation*;**
Melt the Wax by heating, and after melting mix all Wood powders to it.And put the mixture to a plastic bag.



Plastic Bag

Closed Paper with Potassium Chlorate [$KClO_3$] + Sugar [$C_{12}H_{22}O_{11}$] mixture

Capsule with Sulphuric Acid [H_2SO_4]

Wax + Wood powder mixture

Uses*:*
It is used for things made of heavy wood, such as ships and houses made of wood.

vi. FAST BURNING BOMBS:

Ratio: 1 volume Potassium Nitrate [KNO_3] + 3 volume Wood powder [$C_6H_{10}O_5$]

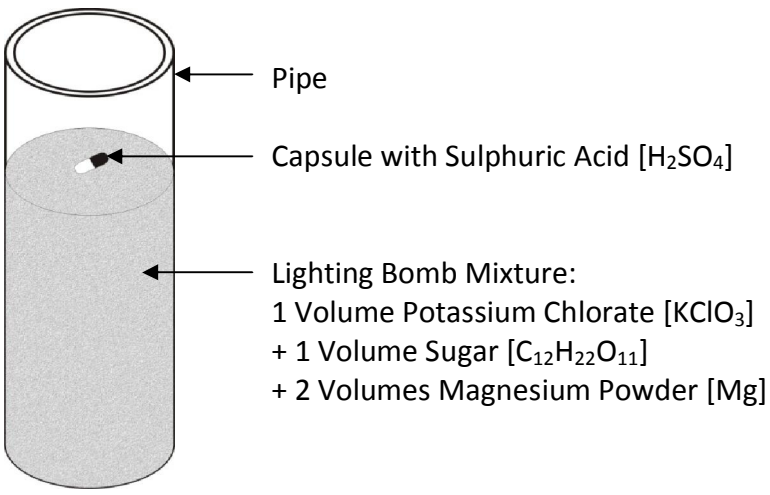
Uses*:*
It is used for light targets like cloth factories or paper factories. The mixture is put in a plastic bag and can be burnt using Sulphuric Acid capsule just like the slow burning bomb.

b. LIGHTING BOMB:

Uses:
It is used before attacking enemies, used in night.

It is a mixture of Potassium Chlorate [$KClO_3$], Sugar[$C_{12}H_{22}O_{11}$] and Magnesium Powder [Mg][33].

Ratio;
1volume Potassium Chlorate [$KClO_3$] + 1volume Sugar [$C_{12}H_{22}O_{11}$] + 2volumes Magnesium Powder [Mg].



Note: If Sulphuric Acid [H_2SO_4] is not available we can also fire it using flame.

[33] We can use Aluminum [Al] if Magnesium Powder [Mg] not available.

c. SMOKE BOMB:

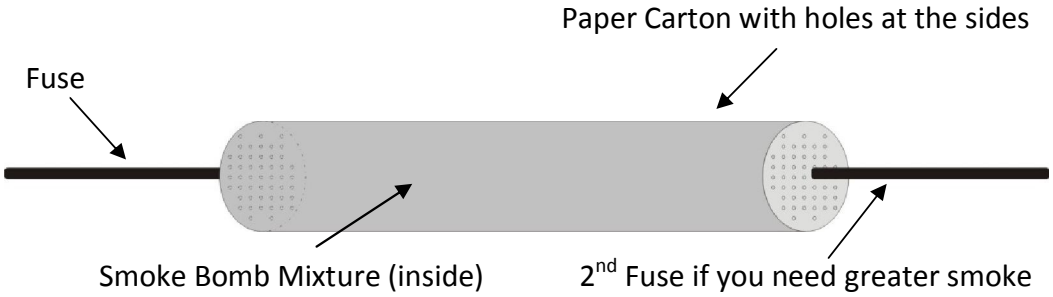
Uses:
It is used to escape from enemy and to give signals.

Mixture:

33g Hexachloro Ethane [C_2Cl_6]
+ 67g Zinc Oxide (i.e. wall putty)

or if HexachloroEthane not available,

22g Potassium Chlorate [$KClO_3$]
+ 7.5g Sulphur [S]
+ 10g Aluminium Powder [Al]
+10g Zinc Powder [Zn]
+ 1.5g Sodium Carbonate[34] [Na_2CO_3]



You can also use the following mixture as for yellow colour smoke bomb:

50 Paranitro aniline [$C_6H_4NH_2NO_2$]
+ 25 Potassium Chlorate [$KClO_3$]
+ 25 Sugar [$C_{12}H_{22}O_{11}$]

[34] Sodium Carbonate [Na_2CO_3] is only required if you need to store the mixture, but otherwise there is no need for it.

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