

Metal and Non Metal

✓ Metals
and
Non-Metals

Introduction

Metals



Lead



Gold



Silver



Copper

Non-metals



Diamond



Carbon



Sulfur



Phosphorus

PHYSICAL PROPERTIES OF METALS AND NONMETALS



Physical Properties of Metal

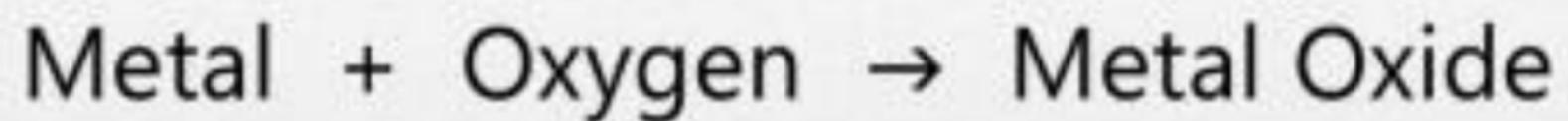
Properties	Metals	Non-metals
Appearance	Shiny (lustrous)	Dull (Non-lustrous)
Hardness	Very hard	Soft
Malleability	Malleable	Non-malleable
Ductility	Ductile	Non-ductile
Heat conduction	Good conductor of heat.	Poor conductor of heat
Conduction of Electricity	Good conductor of electricity	Poor conductor of electricity

Reactivity of some common metals

K (Potassium)	Most reactive
Na (Sodium)	
Ca (Calcium)	
Mg (Magnesium)	
Al (Aluminium)	
Zn (Zinc)	
Fe (Iron)	
Pb (Lead)	
H (Hydrogen)	
Cu (Copper)	
Hg (Mercury)	
Ag (Silver)	
Au (Gold)	Least reactive

Reactivity decreases on moving from top to bottom

CHEMICAL PROPERTIES OF METALS



When copper is heated in air it combines with oxygen to form copper oxide a black oxide .

What is the balanced symbol equation for each reaction?

magnesium + oxygen → magnesium oxide



copper + oxygen → copper oxide



iron + oxygen → iron oxide



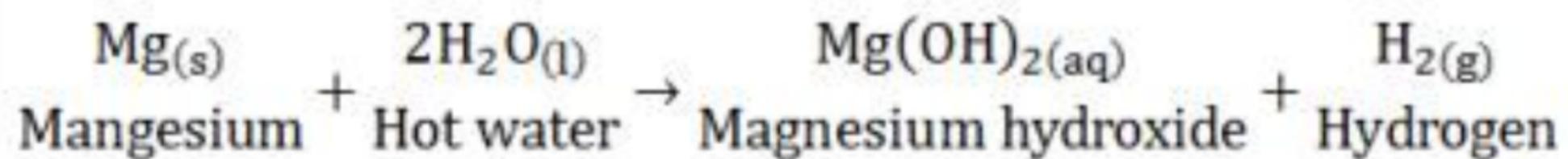
Atmospheric oxide

Metal oxides are basic in nature . but some metal oxide such as Aluminium oxide, zinc oxide so both acidic as well as basic behaviour such metal oxide which react with both acid as well as basis to produce salt and water are known as atmospheric oxide .

Most metal oxides are insoluble in water but some of these dissolve in water up to form alkalis. some sodium oxide and potassium oxide dissolve in water to produce alkalis .

Reactivity of metals with water

- **Metal react with water produce metal oxide and hydrogen gas**
 - **some metal oxide are soluble in water, forming metal Hydroxides. Potassium and sodium react violently with cold water leading to immediate ignition of hydrogen gas**
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 - **Calcium react with water is less violent with you all heat not sufficient to catch hydrogen on fire**
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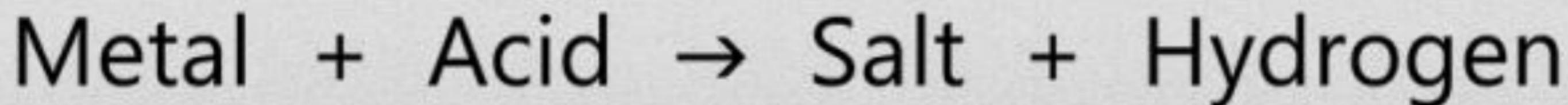
Aluminium ,iron and Zinc do not react with cold or hot water but they react with steam to form metal oxides and hydrogen .

Metal like lead, copper ,silver and gold do not react with water at all .

Metal reactivity with acid

Metal react with acid to give a salt and hydrogen gas

but hydrogen gas is not evolved when a metal react with nitric acid . this is due to the strong oxidizing nature of the nitric acid



Magnesium and Manganese react with very dilute nitric acid, evolving hydrogen gas .

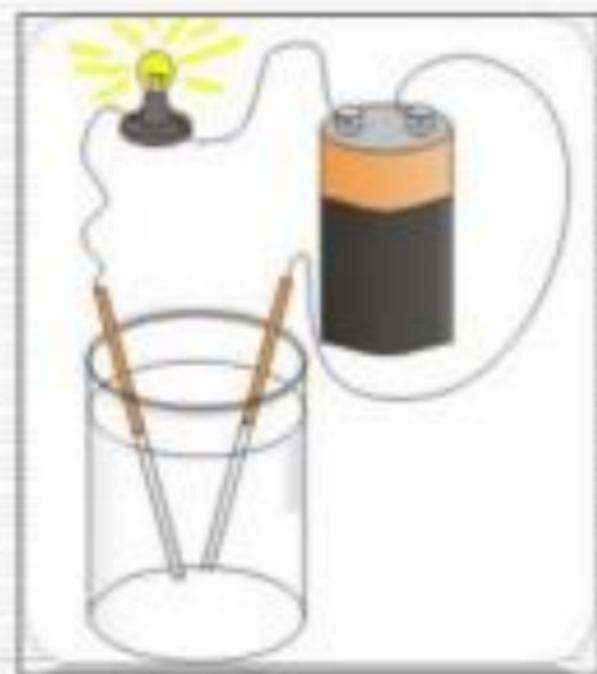
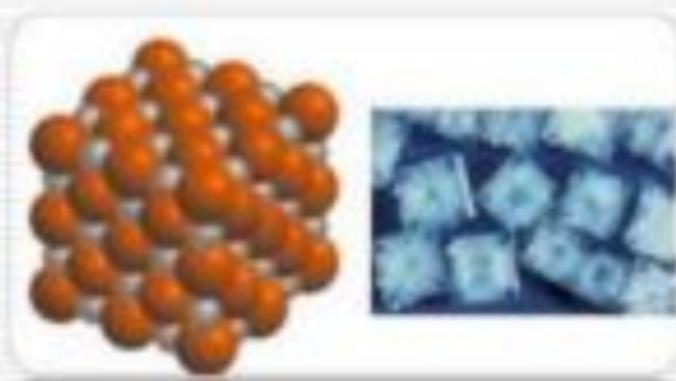
Aqua Regia

- Aqua regia – 1 part conc. HNO_3 + 3 parts conc. HCl
- Piranha acid – 3 parts conc. H_2SO_4 + 1 part H_2O_2 (30% or less)
- 50% H_2O_2 or greater can lead to explosions



Properties of Ionic Compounds

1. High Melting and boiling points (indicating strong bond strength)
2. Most are crystalline solids at room temperature
3. ions in a regular, geometric pattern (crystal lattice)
4. hard, brittle
5. conduct electricity when molten or dissolved in water (aka **electrolyte**)



Occurrence of Metals

धातु की प्राप्ति उपलब्ध।

Minerals

खनिज

न.व.। पौगिरु

the element or compounds which occur naturally in the earths crust are called minerals .

मृदा के नीचे प्राकृतिक रूप में प्राप्त

Ores

अयस्क

Minerals that contain very high percentage of particular metal and the metal can be profitably extracted from it , such minerals are called ores

लाभकारी

अयस्क

रूपा खनिज जिसे अधिक मात्रा में धातु की

उपलब्धि तथा निम्न शोधन करना

लौह अयस्क
हेमेटाइट, मैग्नेटाइट

Examples of Ores

कॉपी - पायराइट

Iron Ore



Hematite



Magnetite

Copper Ore



Pyrite



Bornite

Zinc Ore



Sphalerite



Zinc Blende



Calamine

धातु
↓
AH

मिश्रधातु (Alloy)

① पीतल (ब्राम) \longrightarrow Cu (तांबा) (70%) ^{30%} ZnK (जस्ता)

② Steel \longrightarrow Fe + C ✓
कोमिपक्ष

स्टेनलेस स्टील \longrightarrow Fe + C + Ni + Cr

④ कांसा \longrightarrow Cu (88%) + Sn (12%)

शंका (Solder)

लेड (Lead) + Sn (Tin)

जर्मन सिल्वर

Cu (50%) + Zn (35%) +

Ni (15%)

पेलमेटल → तांबा + तिन

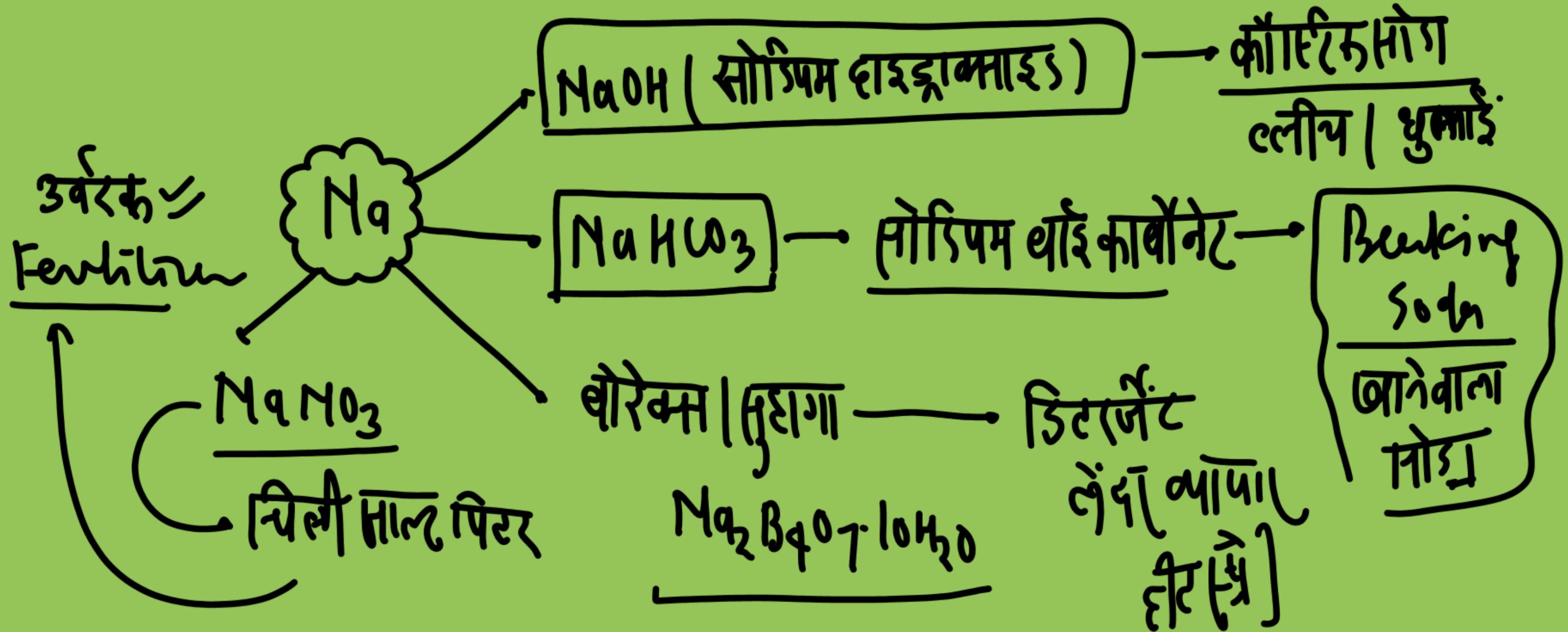
S चमेटल → तांबा + तिन

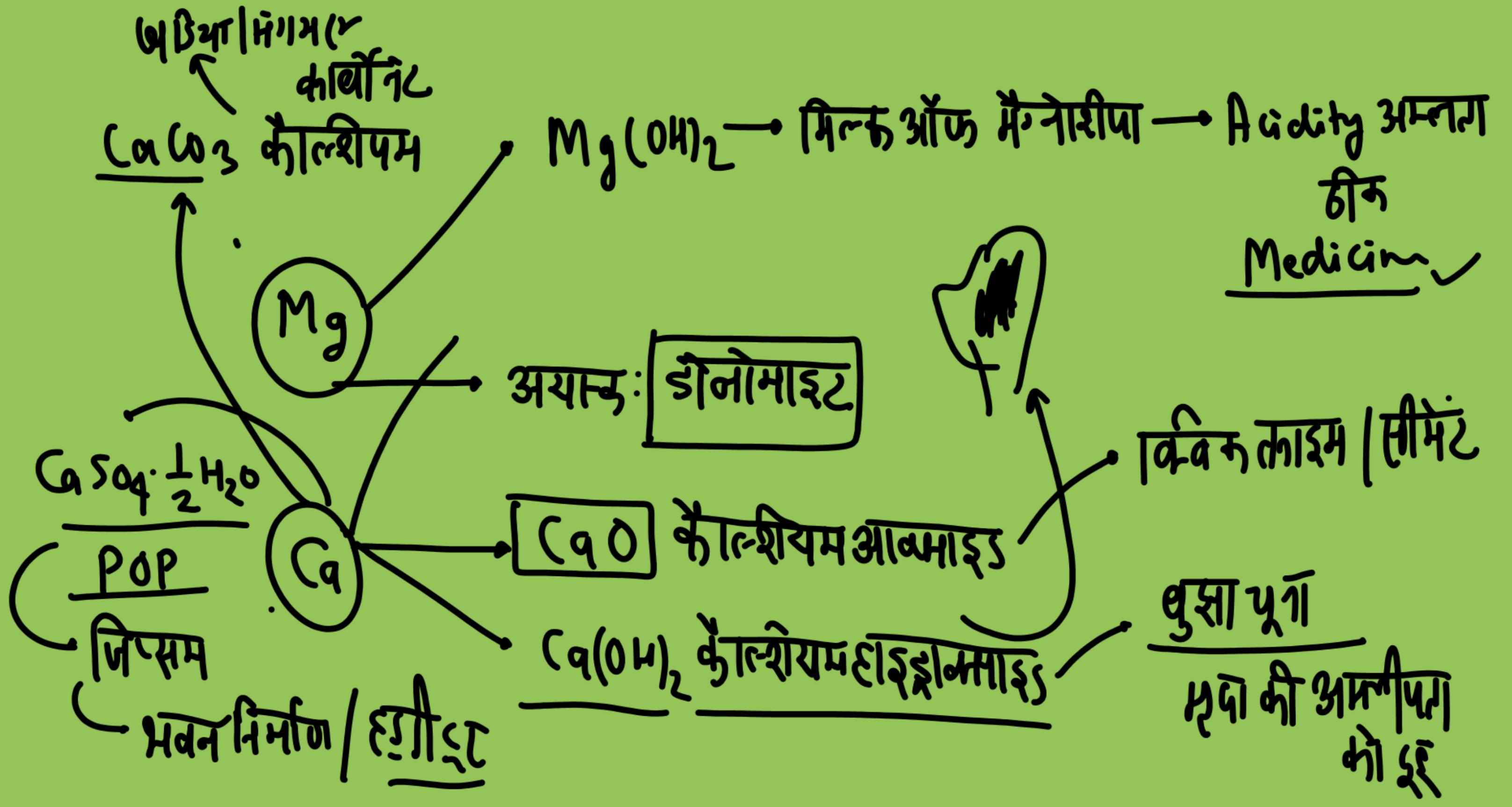
नाइक्रोम → Ni + Cr

गुन मेटल → Cu + Sn + Zn

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Metal: Compounds and Application.





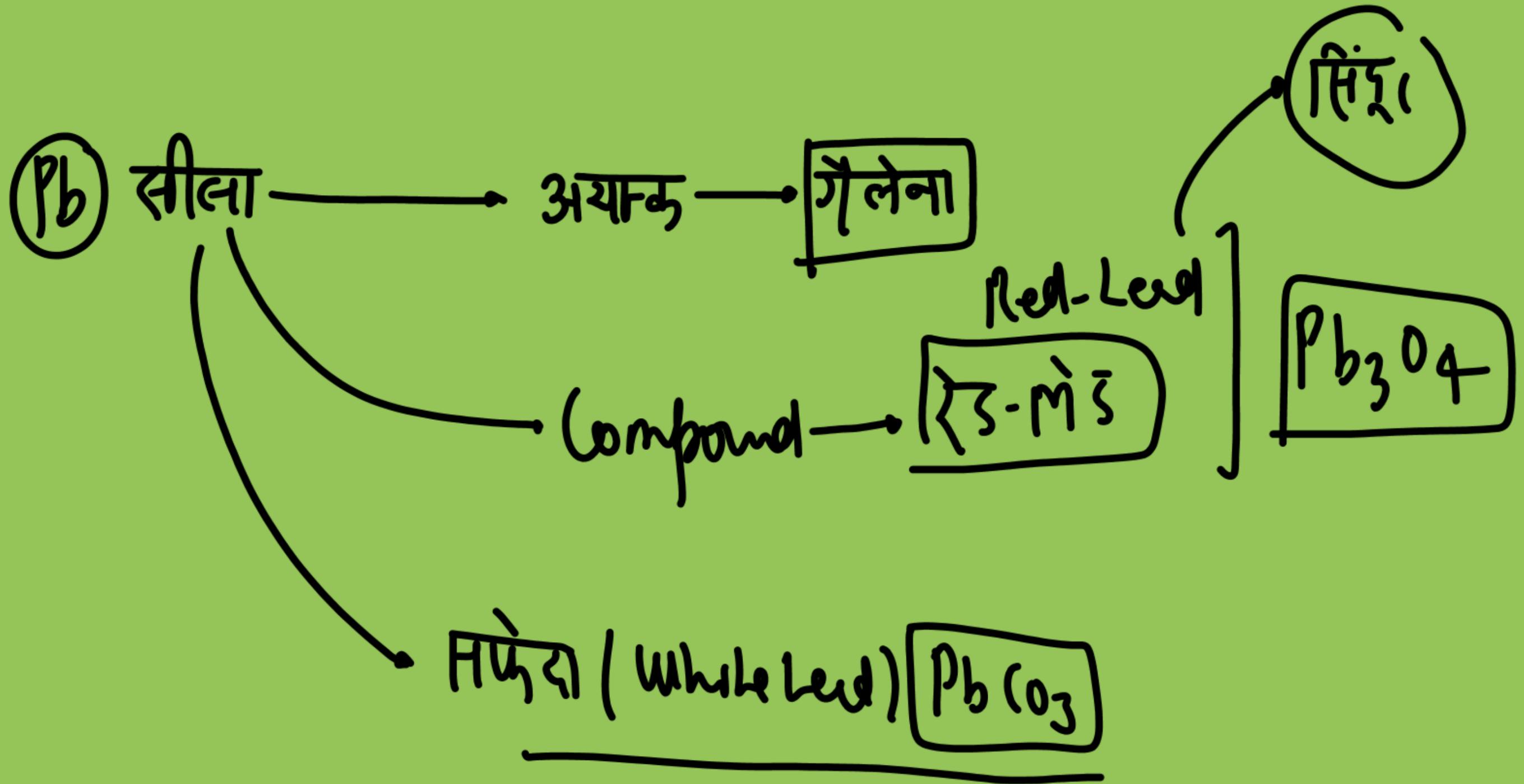
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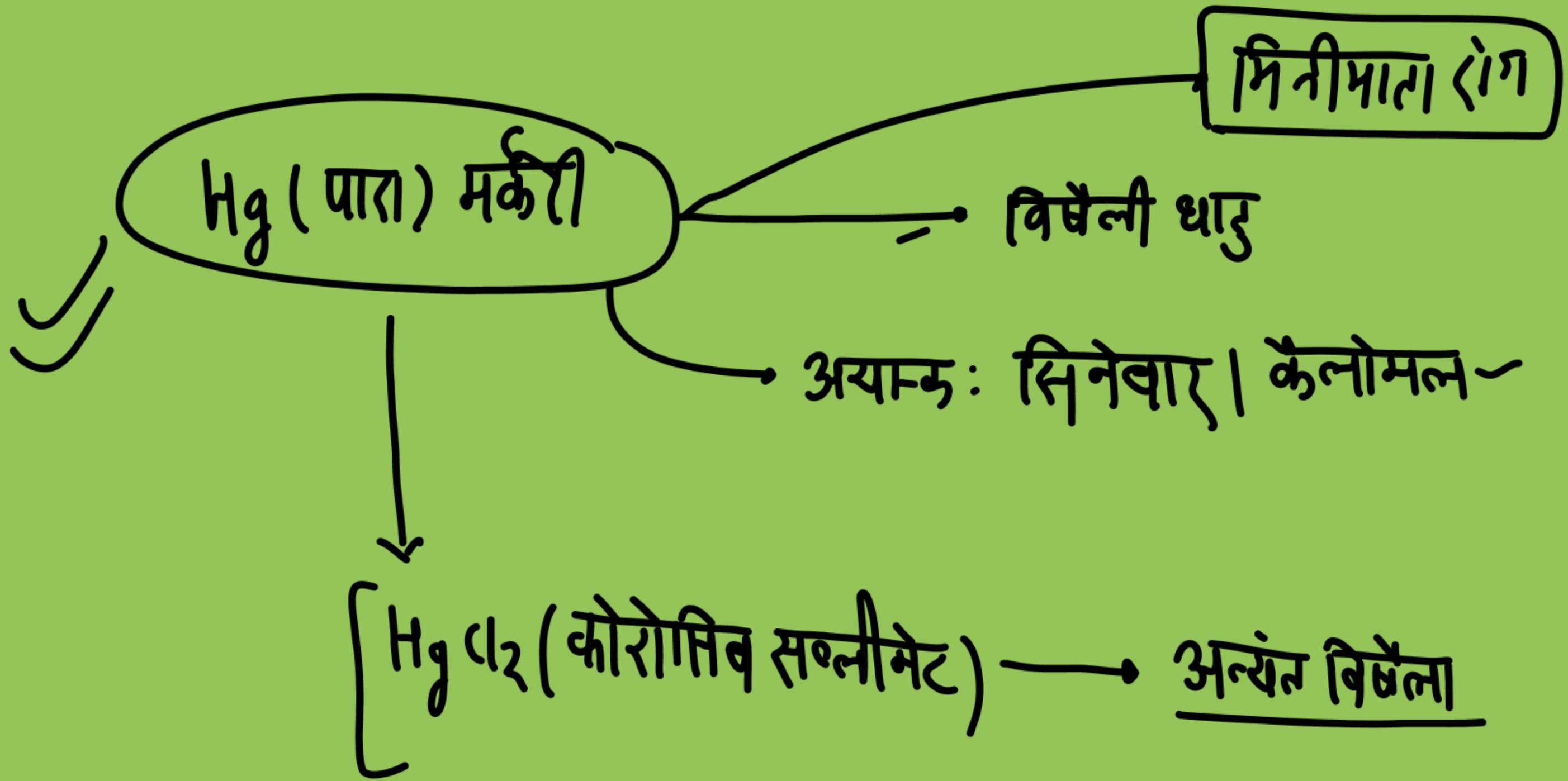
अथवा → वाष्पाइड | सायफोट | कोरेडम ✓

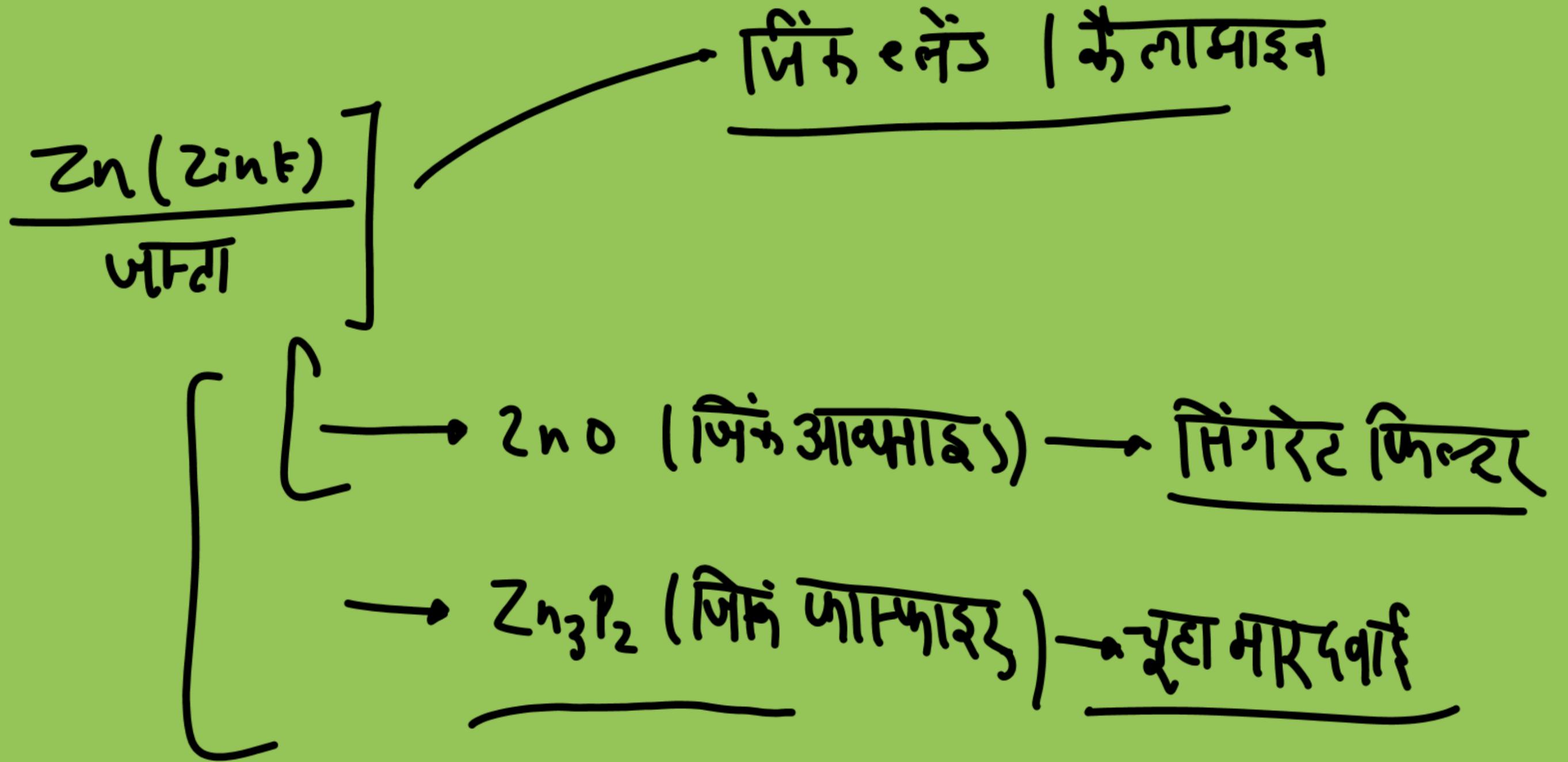
फिटकरी (पोटाश एलुम)



Blood clotting / Medicine / लेटर व्यवसाय







Energy → Chemistry.

Daily wr of chemistry.

Environ
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