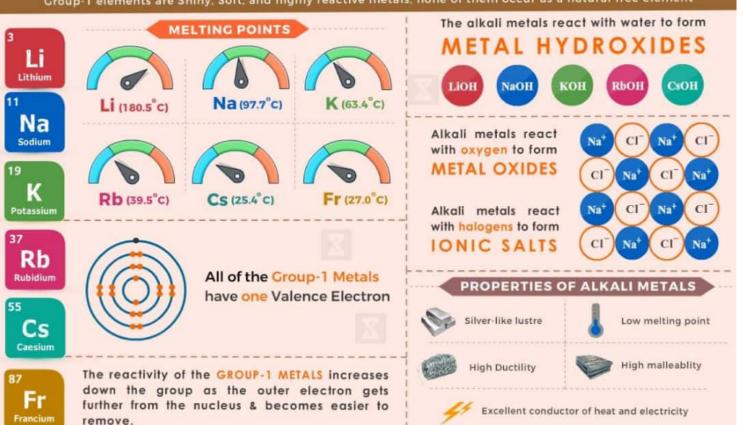
Part-I

GROUP – 1 THE ALKALI METALS

Group-1 elements are Shiny, Soft, and highly reactive metals, none of them occur as a natural free element



Part-II

Properties of Alkali Metals



COLOR

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FLAM













- Alkali metals can be easily cut with a knife
- Among all alkali metals lithium is hardest.

ATOMIC SIZE

Size increases down the group due to

STORED IN KEROSENE

Alkali metals react with

air easily to form oxide

are stored in kerosene.

layer therefore they

added extra orbit.





They have one valence shell electron.

ns¹

ELECTRONIC CONFIGURATION

General valence electronic configuration



It is the ability to remove an electron



- Electropositivity increases down the group.
- Caesium has the highest electropositive character.

REACTS WITH WATER



- They reacts violently with water and form hydroxides.
- Don't even dare to go near when caesium reacts with water.

LITHIUM

- Anti depressants
- Batteries



SODIUM

- Street lamps
- Salt



POTASSIUM

Fertilizers



CAESIUM

Atomic Clocks



REACTS WITH AMMONIA

On dissolving NH3 forms Ammoniated cation and electron. Solution turns blue

 $M^+ + \times NH_3 \rightarrow [M (NH_3)_x]^+$ $e^- + y NH_3 \rightarrow [e (NH_3)_y]^-$



ALKALINE EARTH METALS













ELECTRONIC CONFIGURATION



Valence Electrons = 2

FLAME COLOUR TEST

Group II Element Flame Colour

Beryllium Colourless
Magnesium Colourless
Calcium Brick red
Strontium Crimson red

Barium Apple green

DO YOU KNOW?

Kidney stones generally consist of calcium oxalate. CaC₂O₄. H₂O which dissolves in dilute strong acids but remains insoluble in bases.



They are commonly called alkaline earth metals because their oxides are alkaline in nature and are found in earth's crust.

REACTION WITH WATER

Be does not react even with boiling water and **Ba** react vigorously even with cold water. Thus increasing order of reactivity with water is

Mg < Cr < Sr < Ba

ATOMIC SIZE

Size increases down the group due to added extra orbit.

ELECTROPOSITIVITY

BERYLLIUM

Strong electropositive elements due to large size, electropositivity increases down the group.

REACTION WITH NITROGEN

These metals react with nitrogen to form nitrides of the types M₃N₂ which are hydrolysed with water to evolve NH₃.

3M + N₂ → M₃N₂

 $M_3N_2 + 6H_2O \implies 3M(OH)_2 + 2NH_3$

STRONTIUM - -

Ammonia

----- USES

Corrosion resistant alloys

1

Glass for colour television cathode ray tubes

O MAGNESIUM -

Present in chlorophyll, helps in photosynthesis

- CALCIUM

Hydrated CaCl₂ used for melting ice on roads

OBARIUM

Nuclear Medicine

ALKALI METALS

DIFFERENCE BETWEEN

ALKALINE EARTH METALS

PROPERTIES	ALKALI METALS	ALKALINE EARTH METALS
Physical properties	Soft, Low melting point, Paramagnetic.	Comparatively harder. High melting point, Diamagnetic
Valency	Monovalent	Bivalent
Electropositive nature	More electropositive	Less electropositive
Hydroxides	Strong base, highly soluble and stable towards heat.	Weak base, less soluble and decomposes on heating.
Bicarbonates	These are known in solid state.	These are not known in free state. Exist only in solution
Carbonates	Soluble in water. Do not decomposes on heating (LiCO ₃ is an exception)	Insoluble in water. Decomposes on heating.
Action of carbon	Do not directly combine with carbon	Directly combine with carbon to form carbides
Solubility of salts	Sulphates, phosphates, fluorides, chromates, oxides etc are soluble in water.	Sulphates, phosphates, fluorides, chromates, oxalates etc are insoluble in water
Reducing power	Stronger as ionization potential values are low and oxidation potential values are high	Weaker as ionization potential values are high and oxidation potential values are low.
Electronic configuration	One electron is present in the valence shell. The configuration is ns ¹ (monovalent)	Two electrons are present in the valence shell. The configuration is ns ² (bivalent)