Inorganic Chemistry - III

- Representative Elements- I

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Module ll-Representative elements-l

- Hydrogen –Position of hydrogen in the periodic table
- Hydrogen – Atomic Number=1- Electronic configuration 1S1
- H2 resembles both alkali metals and halogens. However H2 differ from these elements in some aspect also. Hence its position in periodic table is anomalous.
- Comparison of Hydrogen with alkali metals –
- Resemblance with alkali metals
- Outer electronic configuration for both H2 and alkali metals - ns1
- .Alkali metals and hydrogen are electropositive and monovalent.
- eg: Halides of both alkali metals and hydrogen (KCl,NaCl and HCl) produce K+ ,Na+ and H+ ions.
- Alkali metals give halides, oxides and sulphides by combining with halogens, oxygen and sulphur (eg: KCl,Na2O,Na2S etc…). Hydrogen also give similar compounds like HCl,H2S, H2O etc…
- .Alkali metals and hydrogen are reducing agents.

Difference with alkali metals

- Its ionization enthalpy (1312kJ) is higher than alkali metals.

- Unlike alkali metals it can form mono negative ion

- Unlike alkali metals it can form covalent compounds with non metals .eg:

  CH_4, SiH_4….

- Unlike alkali metals, hydrogen is in gaseous state at room temperature and forms diatomic molecules (H_2)

• **Comparison with halogens** .

Resemblance

•Electronic configuration of halogens is ns^2np^5 –require one more electron to attain noble gas electronic configuration. Hydrogen also require one more electron to attain noble gas electronic configuration(He)

•Its ionization enthalpy (1312 kJ) is comparable to that of Halogens

•Both halogens and hydrogen form mono negative ions .eg: Cl^-,Br^- and H^-

•Like halogens ,it form covalent compounds with non metals.eg: CCl_4andCH_4

•Halogens and hydrogen form diatomic molecules .eg:Cl_2,$Br_2$and H_2

Differences

- Unlike halogens, hydrogen form mono positive ions H^+

- Unlike halogens, Hydrogen is not reactive as halogens