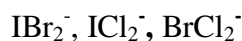


## POLYHALIDES

### General methods of preparation and Chemical Properties

When the halide ions combine with the halogen molecules or interhalogens, univalent ions are obtained, these are known as polyhalide ions and the compounds of these are known as polyhalides.

Polyhalide ions:



Polyhalide compounds :  $\text{KICl}_4, \text{NaIBr}_4, \text{NH}_4\text{IBr}_2, \text{KI}_3$

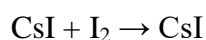
### Classification

- $\text{X}_n^- \rightarrow \text{I}_3^-, \text{I}_5^-, \text{I}_7^-, \text{I}_9^-$
- $\text{XX}^{\text{I}}_n \rightarrow \text{ICl}_2^-, \text{IBr}_2^-$
- $\text{XX}^{\text{I}}\text{X}^{\text{II}}_n \rightarrow \text{IClBr}^-$
- $\text{XXn}^{\text{I}} \rightarrow \text{ICl}_2^-, \text{IBr}_2^-, \text{ICl}_4^-$
- $\text{XYZn}^{\text{I}} \rightarrow \text{FIBr}^-, \text{ClBr}^-$

### Methods of Preparation

Direct addition of Halogen to Halide

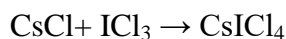
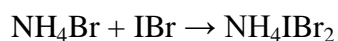
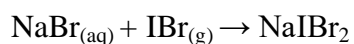
$\text{I}_2$  is added to  $\text{CsI}$



$\text{Cl}_2$  is added to  $\text{KI}$  in aqueous solution



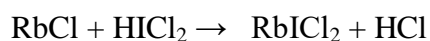
Direct addition of Interhalogen to Halide



Metathesis

Double Decomposition

Involving another Polyhalide



### Properties:

Low melting coloured solids.

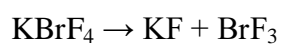
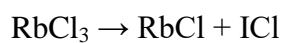
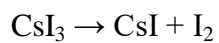
Colour ranges from yellow to black

Soluble in solvents of high dielectric constants

Ionic solids

Tend to decompose on heating –

Simple halide and halogen or Interhalogen



Polyhalides get hydrolysed to some extent in aqueous solution.

Tendency increases with introduction of more electronegative halogens