**TEST TUBE REACTIONS FOR TOPIC 6**

1. **Halogen Displacement Reactions**

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|  | Chloride | Bromide | iodide |
| Chlorine |  | Yellow/Orange solution (orange in cyclohexane)  Cl2 + 2Br- 🡪 Br2 + 2Cl- | Yellow/Brown solution  (purple in cyclohexane)  Cl2 + 2I- 🡪 I2 + 2Cl- |
| Bromine | Yellow/Orange solution (orange in cyclohexane)  No reaction |  | Yellow/Brown solution  (purple in cyclohexane)  Br2 + 2I- 🡪 I2 + 2Br- |
| Iodine | Yellow/Brown solution  (purple in cyclohexane)  No reaction | Yellow/Brown solution  (purple in cyclohexane)  No reaction |  |

The more reactive halogen (ie the halogen with more oxidising power) is always reduced

The more reactive halide (ie the halide with more reducing power) is always oxidised

1. **Group 2 Precipitation Reactions**

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| --- | --- | --- | --- |
| Solution | Observation on adding H2SO4 | conclusion | Ionic equation |
| MgCl2 | No visible reaction | MgSO4 is soluble |  |
| CaCl2 | No visible reaction | CaSO4 is soluble |  |
| SrCl2 | Faint white precipitate | SrSO4 is only slightly soluble | Sr2+(aq) + SO42-(aq) 🡪 SrSO4(s) |
| BaCl2 | Thick white precipitate | BaSO4 is insoluble | Ba2+(aq) + SO42-(aq) 🡪 BaSO4(s) |

Conclusion: The solubility of Group 2 sulfates decreases down the group

|  |  |  |  |
| --- | --- | --- | --- |
| Solution | Observation on adding NaOH | conclusion | Ionic equation |
| MgCl2 | Thick white precipitate | Mg(OH)2 is insoluble | Mg2+(aq) + 2OH-(aq) 🡪 Mg(OH)2(s) |
| CaCl2 | Faint white precipitate | Ca(OH)2 is only slightly soluble | Ca2+(aq) + 2OH-(aq) 🡪 Ca(OH)2(s) |
| SrCl2 | No visible reaction | Sr(OH)2 is soluble |  |
| BaCl2 | No visible reaction | Ba(OH)2 is soluble |  |

Conclusion: Solubility of Group 2 hydroxides increases down the group

1. **Group 7 Precipitation Reactions**

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| --- | --- | --- |
| Halide ion | Observation on adding AgNO3(aq) | Observation on adding NH3 |
| F- | No precipitate |  |
| Cl- | White precipitate  Ag+(aq) + Cl-(aq) 🡪 AgCl(s) | Precipitate dissolves in dilute NH3 |
| Br- | Cream precipitate  Ag+(aq) + Br-(aq) 🡪 AgBr(s) | Precipitate dissolves in concentrated NH3 but not dilute NH3 |
| I- | Yellow Precipitate  Ag+(aq) + I-(aq) 🡪 AgI(s) | Precipitate insoluble in NH3 |