



Properties and Reactions of Alkali Metals and Halogens

| Alkali Metal | Formula of the Ion | Equation for reaction with oxygen with state symbols | Observations when reacted with water | Equation for reaction with Water with state symbols | Trend in reactivity |
|--------------|--------------------|---|---|--|--|
| Lithium | Li^+ | $2\text{Li} + \text{O}_2 \rightarrow \text{Li}_2\text{O}$ | Fizzing/bubbles Li moves on surface of water Li gets smaller | $2\text{Li(s)} + 2\text{H}_2\text{O(l)} \rightarrow 2\text{LiOH(aq)} + \text{H}_2\text{(g)}$ |  As you go down the group, reactivity... increases |
| Sodium | Na^+ | $2\text{Na} + \text{O}_2 \rightarrow \text{Na}_2\text{O}$ | Fizzing/bubbles Na moves on surface of water Na gets smaller | $2\text{Na(s)} + 2\text{H}_2\text{O(l)} \rightarrow 2\text{NaOH(aq)} + \text{H}_2\text{(g)}$ | |
| Potassium | K^+ | $2\text{K} + \text{O}_2 \rightarrow \text{K}_2\text{O}$ | Fizzing/bubbles K moves on surface of water K gets smaller K burns with a purple/lilac flame | $2\text{K(s)} + 2\text{H}_2\text{O(l)} \rightarrow 2\text{KOH(aq)} + \text{H}_2\text{(g)}$ | |

| Halogen and formula | Formula of the ion | State at room temp. | Colour at room temp. | Colour of the vapour | Colour of solution (dissolved in water) | Hazards and safety precautions | Reactivity |
|---------------------|-----------------------|---------------------|----------------------|----------------------|---|--|--|
| Chlorine | Cl⁻ | Gas | Green | Yellow | Colourless | Toxic and corrosive gas Use a fume cupboard |  As you go down the group, reactivity... decreases |
| Bromine | Br⁻ | Liquid | Reddish brown | Orange | Orange | Toxic and corrosive gas Use a fume cupboard | |
| Iodine | I⁻ | Solid | Dark grey | Purple | Brown | Toxic and corrosive gas Use a fume cupboard | |