

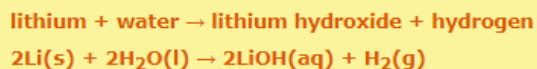
Group 1 – Physical properties of alkali metals

- Low melting points and boiling points (decreases down the group)
- Very soft
- Can test for chlorine gas using damp blue litmus paper which turns red, then bleaches white



Group 1 – Reaction of alkali metals with water

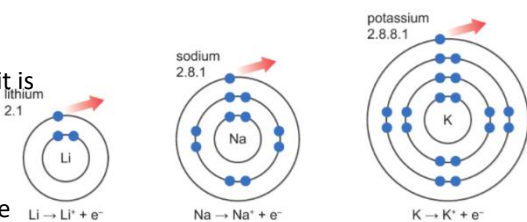
- React vigorously with water
- Reactivity increases down the group (because the outer electron is lost more easily)



reactivity 	lithium + water	bubbles fiercely on the surface
	sodium + water	melts into a ball and fizzes about the surface
	potassium + water	bursts into flames and flies about the surface

Group 1 – Reactivity

- Reactivity increases down the group
- Alkali metals need to lose one electron to form a 1+ ion
- The bigger the atom the easier it is to lose an electron so the more reactive the atom
- This is due to a greater distance (weaker attraction) between the positive charge of nucleus and outer shell electrons



Group 0 – Properties of noble gases

- Non-metals
- Inert (very unreactive)
- Non-flammable
- Colourless
- Monatomic (exist as single atoms)
- Boiling point, melting point and density all increase down the group

Group 0 – Uses of noble gases

Helium

Used in balloons and airships to make them float as it is much less dense than air.



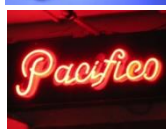
Argon

Used in light bulbs, as it is unreactive it stops the hot filament burning away.



Neon

Used in signs as it glows when electricity passes through it.



Group 7 – Physical properties of halogens

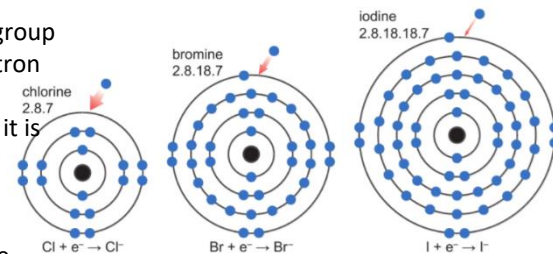


Group 7 – Reaction of halogens with metals and hydrogen

- Halogen + metal → metal halide
E.g. chlorine (g) + sodium (s) → sodium chloride (s)
- Halogen + hydrogen → hydrogen halide
E.g. chlorine (g) + hydrogen (g) → hydrogen chloride (g)
- Hydrogen halides dissolve in water to form acids
E.g. hydrogen chloride (g) → hydrochloric acid (aq)

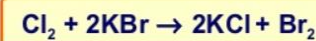
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- Reactivity decreases down the group
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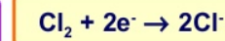


Group 7 – Displacement reactions

- Displacement reaction is where a more reactive element 'pushes out' (displaces) a less reactive element from a compound
- H - Redox reactions: halogens gain electrons (reduction) while halide ions in the salt lose electrons (oxidation)
- Shows order of reactivity: **Chlorine, bromine, iodine**



halogen \ salt (aq)	potassium chloride	potassium bromide	potassium iodide
chlorine	X	$2\text{KCl} + \text{Br}_2$	$2\text{KCl} + \text{I}_2$
bromine	no reaction	X	$2\text{KBr} + \text{I}_2$
iodine	no reaction	no reaction	X



Chlorine is reduced (gains electrons)



Bromide is oxidised (loses electrons)

- O Oxidation
- I Is
- L Loss
- R Reduction
- I Is
- G Gain

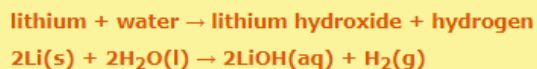
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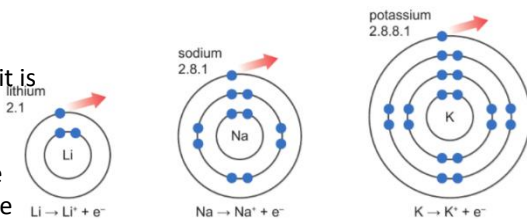
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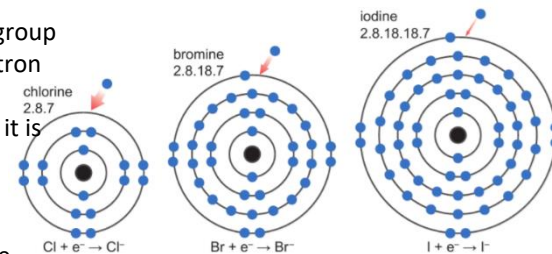


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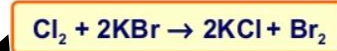
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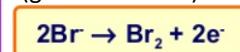
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iodine	no reaction	no reaction	X



Chlorine is reduced (gains electrons)



Bromide is oxidised (loses electrons)

O	Oxidation
I	Is
L	Loss
R	Reduction
I	Is
G	Gain