

Elements

1 Arrangement - periodic table

number of outermost shell e^-

GROUP

number of occupied shells

PERIOD

Transition metals
- elements lying b/w Grp II/III
- hv unknown no. of outermost shell e^-

does not belong to any group

Alkaline earth metals
Alkali metals

Halogens (VII)
Noble gases (0)

Metals

Semi-metals Non-metals

2 Main group elements

GRP 1 - ALKALI METALS

- silvery solids
- soft metals (✓ cut by knife)
- low density (Li, Na, K floats on water)
- reactive
 - > $4M + O_2 \rightarrow 2M_2O \Rightarrow$ stored in paraffin oil
 - > $2M + 2H_2O \rightarrow 2MOH + H_2 \Rightarrow$ gives out hydrogen
 $\quad\quad\quad \Rightarrow$ alkaline solution
- reactivity increases down the group

For more metal reactions
see topic 3: Metals ←

-GRP 11 - ALKALINE EARTH METALS

- silvery solids
- low density (but denser than Grp I)
- less reactive than Grp I (harder to lose outermost e^-)
 - > $M + 2H_2O \rightarrow M(OH)_2 + H_2 \Rightarrow$ less vigorous than Grp I
 \Rightarrow base, insol. in water
- reactivity increases down a group

GRP VII - HALOGENS

- **toxic**
- Fluorine, Chlorine, Bromine, Iodine, Astatine

← gas	← liquid	← solid	→ m.p./b.p. ↑ (size ↑ ⇒ vdw ↑)
← pale yellow	← yellowish green	← reddish brown	→ colour light → dark
- **reactivity decreases** down a group

-GRP 0 - NOBLE GASES

- colourless gases
- very unreactive (duplet / octet electronic structure \rightarrow very stable)

WHY DOES REACTIVITY DIFFER DOWN A GROUP?

- atomic size \uparrow
- attraction % nucleus & outermost shell $e^- \downarrow$
- easier to lose / harder to gain e^-
- reactivity increases / decreases

Grp I-III
Grp IV-VII