

Chemical properties of metals

- Identify the chemical properties of metals
- Recognise that certain metals can form coloured compounds
- Describe the reaction of metals with water
- Represent reactions using word equations

Transition metals

- Middle block of the periodic table
- Form coloured compounds
- Can be used as catalysts

KS4 Periodic Table © PMorton 2013

What does the reaction with water produce?

- All the alkali metals react vigorously with water.
- The reaction with water becomes more vigorous as you go down the group.
- It is an **exothermic** reaction as it releases a lot of heat.
- The reaction produces a gas that ignites a lighted splint with a squeaky pop. What is this gas?
- When green universal indicator is added to the reaction mixture, it turns purple. What does this tell you about the products of this reaction?

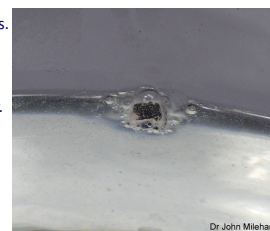


How does lithium react with water?

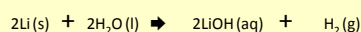
Lithium is the least reactive of the alkali metals.

When added to water, it fizzes and moves around slowly across the surface of the water.

What is the equation for this reaction?



lithium + water → lithium hydroxide + hydrogen

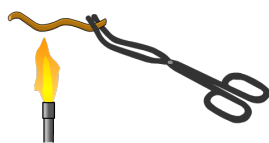


How reactive are the transition metals?

- The transition metals are **much less reactive** than the alkali metals.
- They tend to react relatively slowly, for example with air, water and acid.



Copper does not react with water whereas the alkali metals, such as sodium, react vigorously.

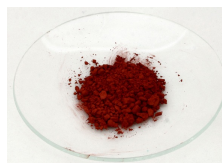


Copper does not burn in air whereas the alkali metals, such as sodium, burn vigorously.

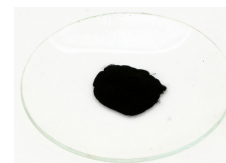
Chemical properties of transition metals

Transition metals can form coloured compounds.

For example:



Copper can form Cu^+ , which can make the red compound copper (I) oxide – Cu_2O .



Copper can also form Cu^{2+} , which can make the black compound copper (II) oxide – CuO .

Transition metal compounds and colour

- Iron (II) oxide (FeO) is **black**.
- Iron (III) oxide (Fe_2O_3) is **red/brown** – when hydrated this is rust.
- Copper (II) sulfate crystals ($\text{CuSO}_4 \cdot \text{H}_2\text{O}$) is **blue** – these can be turned white by heating the crystals to remove the water.

