Metal Reactivity

Identifying unknown metals using their reactions with known metal compounds.

Background

As metals higher in the reactivity series will displace metals lower in the series from their compounds, it should be possible to determine unknown metals by their reaction with known metal compounds. Metals higher in the series (e.g. magnesium) will react with more of the metal compounds, while metals lower in the series (e.g. copper) will react less. A range of metals can be chemically extracted from ores within the Earth's crust through mining and minerals processing.

The Experiment

Aim: to confirm the identify of metal samples by observing their reactions with known metal compounds.

Equipment & chemicals:

- 2 X Spotting trays
- 5 pieces of each sample of the metals (Cu, Al, Zn, Pb, Fe, Mg)
- Solutions of metal compounds (Copper sulphate, zinc sulphate, aluminium sulphate, magnesium sulphate, iron sulphate)
- Steel wool
- Safety glasses
- Gloves

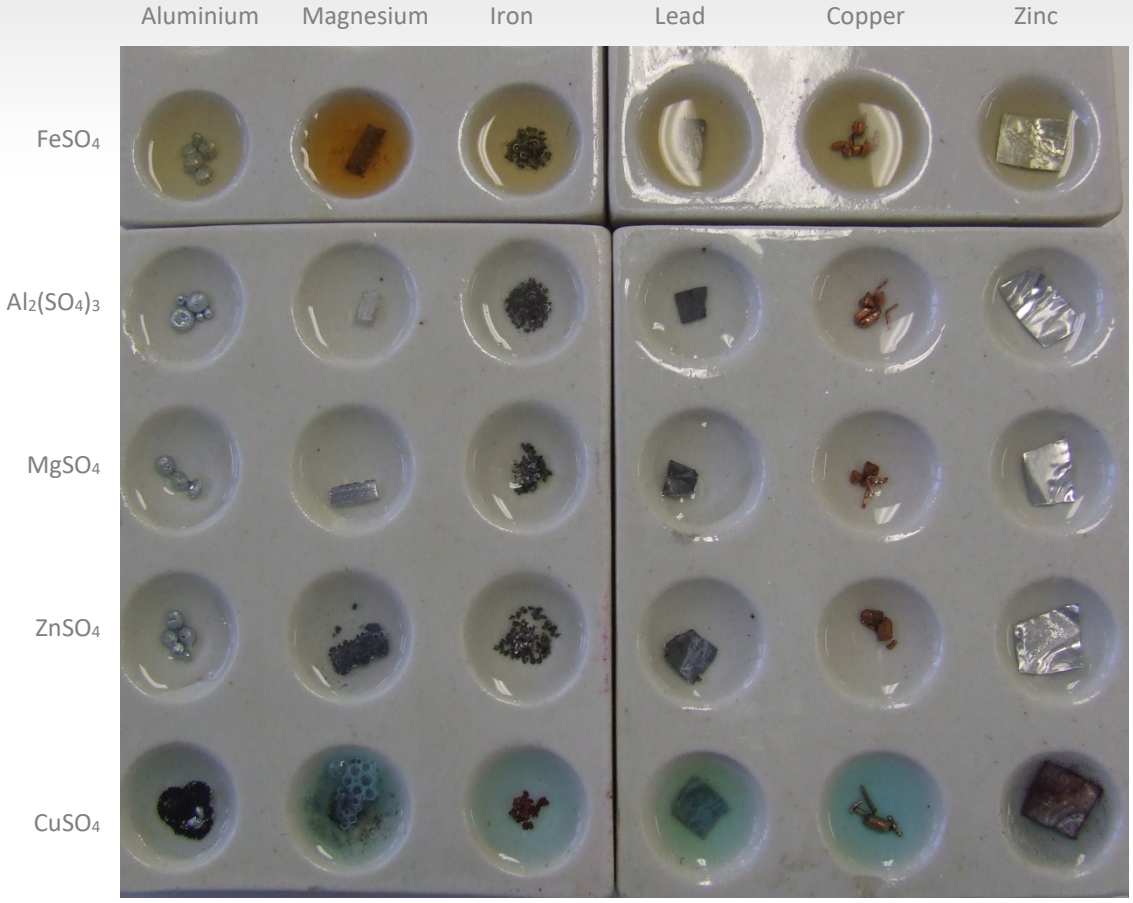
Procedure:

- Clean each sample of unknown metal with steel wool.
- Place samples in divots of spotting tray
- Add different solutions to each metal and observe for reaction
- Record results in table

Results:

Review the image on the following page to view the results from this experiment to complete the Results section. Tick the first column under each metal if you expect a reaction to occur and tick the second column if you can observe that a reaction has occurred.

	Metals											
Known metal compound	Aluminium		Magnesium		Iron		Lead		Copper		Zinc	
$FeSO_4$												
$Al_2(SO_4)_3$												
$MgSO_4$												
$ZnSO_4$												
$CuSO_4$												



Discussion:

Discuss the reactions that allowed you to confirm the identification of each of the metals and write balanced equations for these reactions. Draw upon your understanding of the reactivity series in justifying your identification of the metals.

Conclusion:

Provide a summary of your findings in this experiment.

This experiment sheet has been modified from an existing experiment on OresomeResources, which allows students to analyse data and draw conclusions without needing to complete the experiment while learning at home.