

Worksheet 8.3

Reactivity and electrochemical cells

1 Zinc will displace copper from a solution of copper sulfate, and magnesium will displace zinc from a solution of zinc sulfate.

a Write word equations for these **two** reactions.

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b Write full, balanced chemical equations for the **two** reactions using state symbols.

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c The full equations can be abbreviated to ionic equations. Write ionic equations for the **two** reactions.

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d Why can these displacement reactions be regarded as redox reactions?

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e Write down a reactivity series for these **three** metals, putting them in order of increasing reactivity.

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2 Complete these sentences using the words below to fill the gaps. Some words may be used more than once.

copper displacement reactivity zinc more less

When a more reactive metal is dipped in a solution containing a less reactive metal, a reaction takes place.

An example of this type of reaction is when a piece of is dipped in sulfate solution, where the
..... reactive metal displaces the reactive metal from solution.

Studying these reactions helps us to draw up a series of the metals.

3 Three metals, A, B and C, were set up in separate electrochemical cells, each with copper as the other electrode. Dilute acid solution was used as the electrolyte in each case. The voltages obtained were as follows:

	Voltage / V	Charge on metal electrode
Metal A	2.6	negative
Metal B	0.6	negative
Metal C	0.8	negative

- a How can you tell that all three metals were more reactive than copper?
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- b Place the metals in order of reactivity, with the most reactive metal first.
.....
- c What would be the voltage obtained with the following combinations of metals forming a cell?
- i A and B
 - ii B and C
- d For each of these combinations in part c, state which metal is the negative terminal.
- i
 - ii