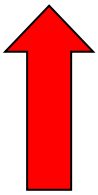
Order of Half equations in the Electrochemical Series

Aim

To perform an experiment to determine the order of four half equations and hence create a mini “electrochemical series”.

Each half –equation can be represented in the form:

Increasing strength of oxidant



$A^{2+}_{(aq)} + 2e^- \rightleftarrows A_{(s)}$

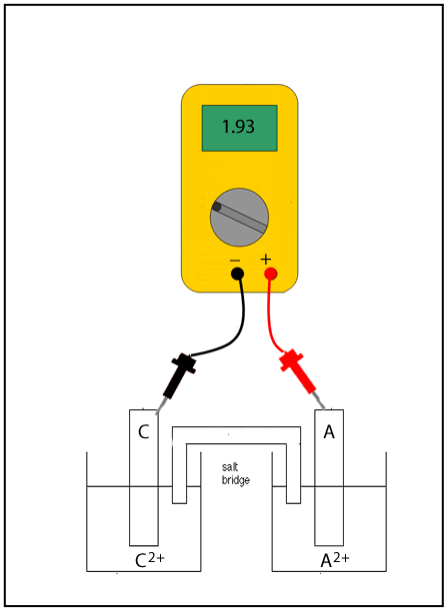
$B^{2+}_{(aq)} + 2e^- \rightleftarrows B_{(S)}$

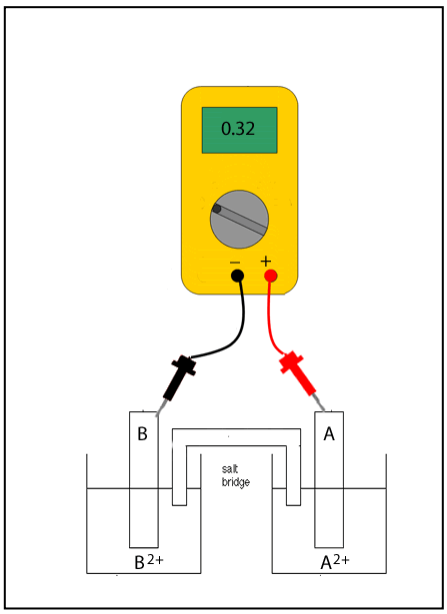
$C^{2+}_{(aq)} + 2e^- \rightleftarrows C_{(S)}$

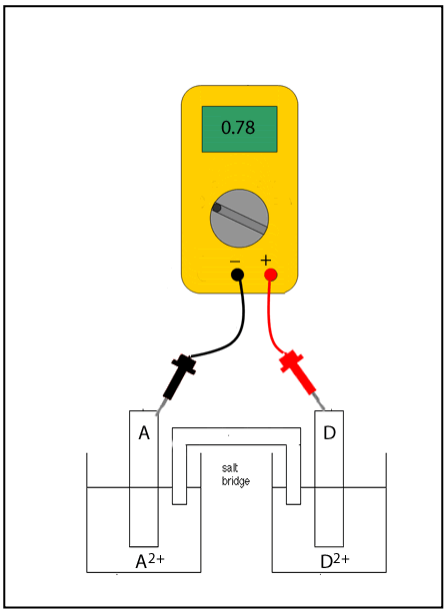
$D^{2+}_{(aq)} + 2e^- \rightleftarrows D_{(S)}$

Below are four cells constructed from the four half-cells shown above. A voltmeter is used to measure the voltage between the two half-cells.

Place the four half cells, shown above, in order from lowest to highest strength of oxidant according to the results obtained from the experiment.







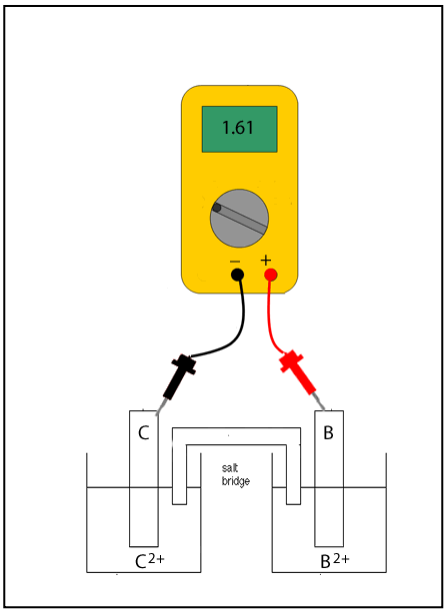


Table 1

Using the E^o series created in table 1 above, set up the cell shown on the right.

a. Indicate the

- direction of electron flow.
- direction of anion flow

b. Calculate the cell EMF.