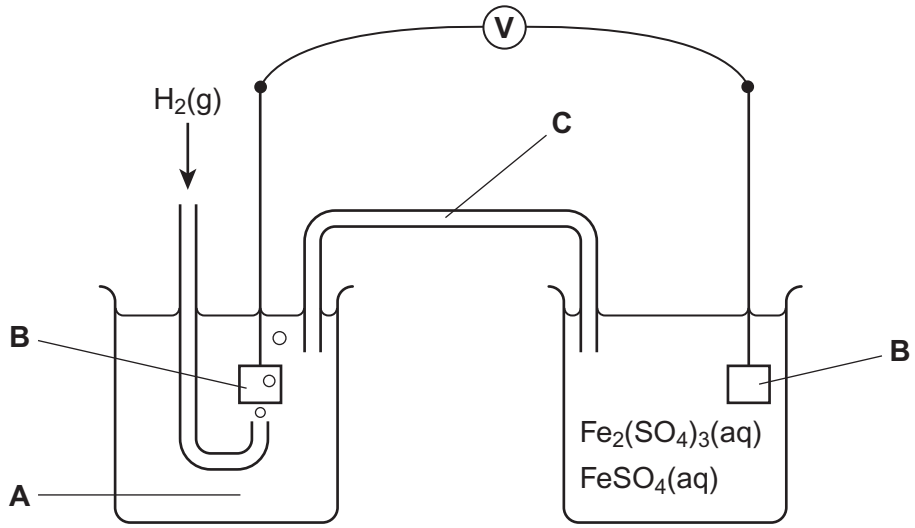
4 The diagram below shows a cell that can be used to measure the standard electrode potential for the half-reaction $Fe^{3+}(aq) + e^- \longrightarrow Fe^{2+}(aq)$. In this cell, the electrode on the right-hand side is positive.



4 (a) Identify solution **A** and give its concentration. State the other essential conditions for the operation of the standard electrode that forms the left-hand side of the cell.

Solution **A** .....

Conditions .....

.....

.....

(3 marks)

4 (b) Identify the material from which electrodes **B** are made. Give **two** reasons why this material is suitable for its purpose.

Material .....

Reason 1 .....

.....

Reason 2 .....

.....

(3 marks)

4 (c) Identify a solution that could be used in **C** to complete the circuit. Give **two** reasons why this solution is suitable for its purpose.

Solution .....

Reason 1 .....

.....

Reason 2 .....

.....

(3 marks)

4 (d) Write the conventional representation for this cell.

.....

(1 mark)

4 (e) The voltmeter **V** shown in the diagram of the cell was replaced by an ammeter.

4 (e) (i) Write an equation for the overall cell reaction that would occur.

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(1 mark)

4 (e) (ii) Explain why the ammeter reading would fall to zero after a time.

.....

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(1 mark)

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