Instructions

1. **Using the VCAA data book E^o series, identify the strongest Oxidant present and the strongest reductant present:**
    - Do they make a negative gradient?
    - Are they in separate half-cells?

2. **Determine the Anode and Cathode:**
    - **Anode:** The electrode where oxidation occurs (loss of electrons) in the half-cell that contains the strongest reductant. It has a negative polarity.
    - **Cathode:** The electrode where reduction occurs (gain of electrons) in the half-cell that contains the strongest oxidant. It has a positive polarity.
      Label the Electrodes

3. **Indicate the Direction of Electron Flow:**
    - Electrons flow from the anode to the cathode through the external circuit.

4. **Label the ion flow through the salt bridge:**
    - Cations (positive ions) always flow to the cathode.
    - Anions (negative ions) always flow to the anode.

5. **Write the Half-Reactions.** The equations may not always be given in the VCAA Data book. If they are in the data book then:
    - **Anode (Oxidation)** half-equation is reversed as written in the E^o series.
    - **Cathode (Reduction)** half-equation is written as shown in the E^o series

6. **Calculate the Cell Potential (E^o):**
    - Use standard electrode potentials to determine the overall cell potential.

$$EMF = E_{\text{Cathode (oxidant)}} - E_{\text{anode (reductant)}}$$

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7. **Label the Overall Cell Reaction:**
    - Combine the half-reactions to write the overall cell reaction. Remember to balance for and then cancel the electrons.

Golden rules for labelling a galvanic cell

1. Anode is always negative (-)

2. Cathode is always positive (+)

3. Oxidation always occurs at the anode

4. Reduction always occurs at the cathode

5. Electrons flow from anode to cathode via the external circuit

6. Negative ions flow to the anode via the salt bridge

7. Positive ions flow to the cathode via the slat bridge

8. The cell EMF must always be positive for a spontaneous reaction to occur between the oxidant and reductant.

1. Consider the galvanic cell shown in fig. 1.

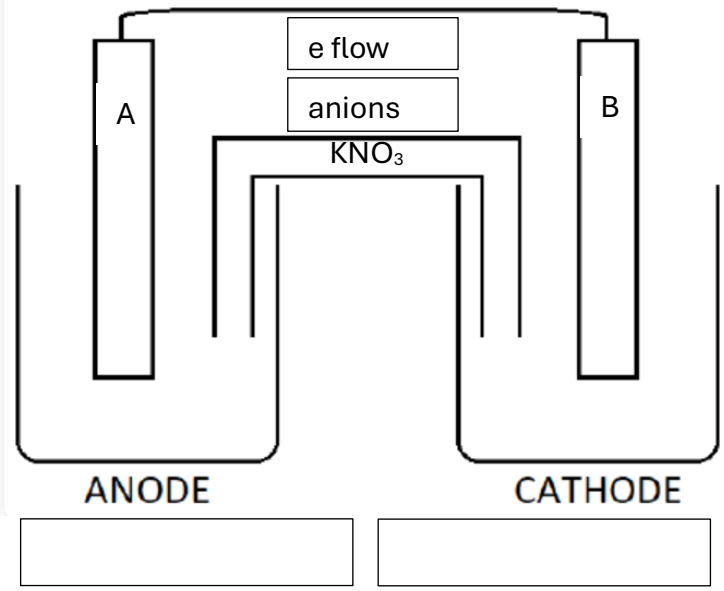

Figure 1- Template of a galvanic cell

a. Place the following half cells in the appropriate place in the template.
$Zn^{2+}(aq) / Zn(s)$ and $Cu^{2+}(aq)/Cu(s)$

b. Write the oxidation and reduction half equations in the appropriate boxes in the diagram in fig. 1.

c. Indicate on the diagram in fig. 1 the direction of electron flow.

d. Indicate in the box in fig 1 the direction of anion flow.

e. Using item 2 of the 2026 VCAA Chemistry Data booklet find the EMF of the cell in fig. 1.

f. What is :
- electrode A made of _____

- electrode B made of _____

2. Consider the galvanic cell shown in fig. 2.

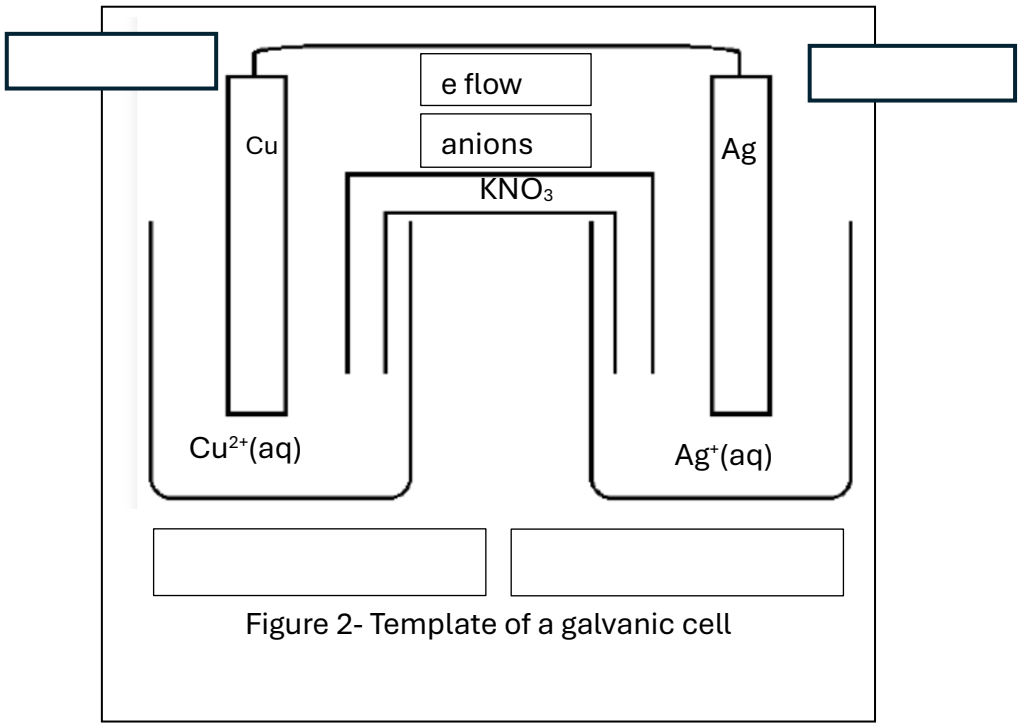

Figure 2- Template of a galvanic cell

a. Label the anode and cathode in the boxes provided in fig. 2

b. Write the oxidation and reduction half equations in the appropriate boxes in the diagram in fig. 2.

c. Indicate on the diagram in fig. 2 the direction of electron flow.

d. Indicate in the box in fig. 2 the direction of anion flow.

e. Using item 2 of the 2026 VCAA Chemistry Data booklet find the EMF of the cell.

f. Write the :

- oxidation reaction _____

- reduction reaction _____

Overall redox equation _____

3. Consider the galvanic cell shown in fig. 3.

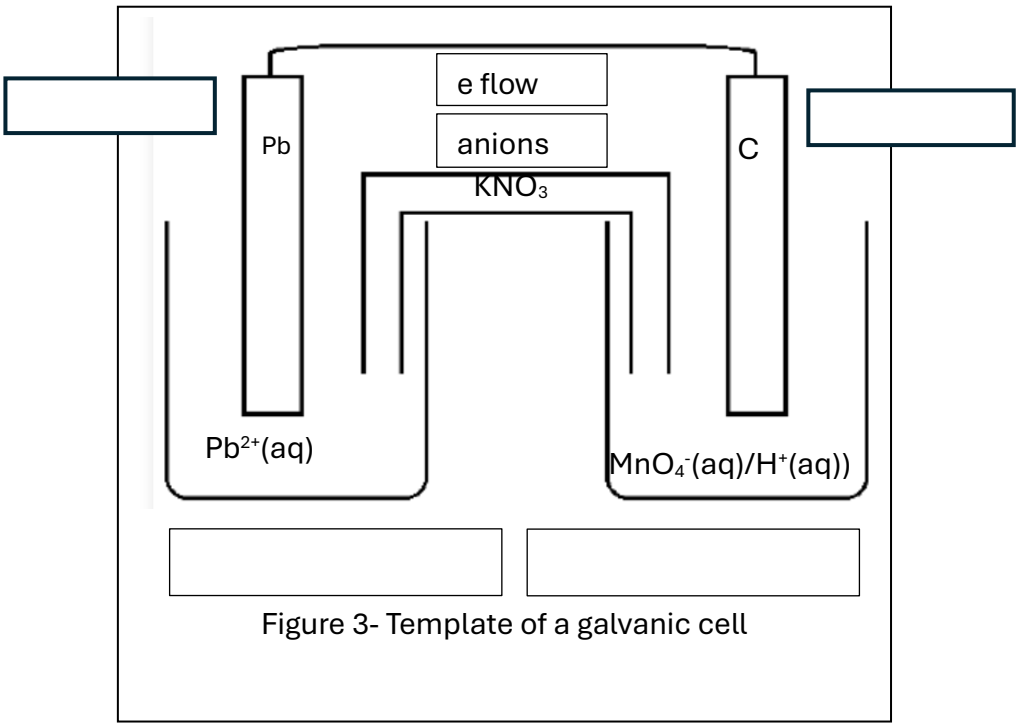

Figure 3- Template of a galvanic cell

a. Label the anode and cathode in the boxes provided in fig. 3

b. Write the oxidation and reduction half equations in the appropriate boxes in the diagram in fig. 3.

c. Indicate on the diagram in fig. 3 the direction of electron flow.

d. Indicate in the box in fig. 3 the direction of anion flow.

e. Using item 2 of the 2026 VCAA Chemistry Data booklet, find the EMF of the cell.

f. Write the :
- oxidation reaction _____
- reduction reaction _____

Overall redox equation _____

4. Consider the galvanic cell shown in fig. 4.

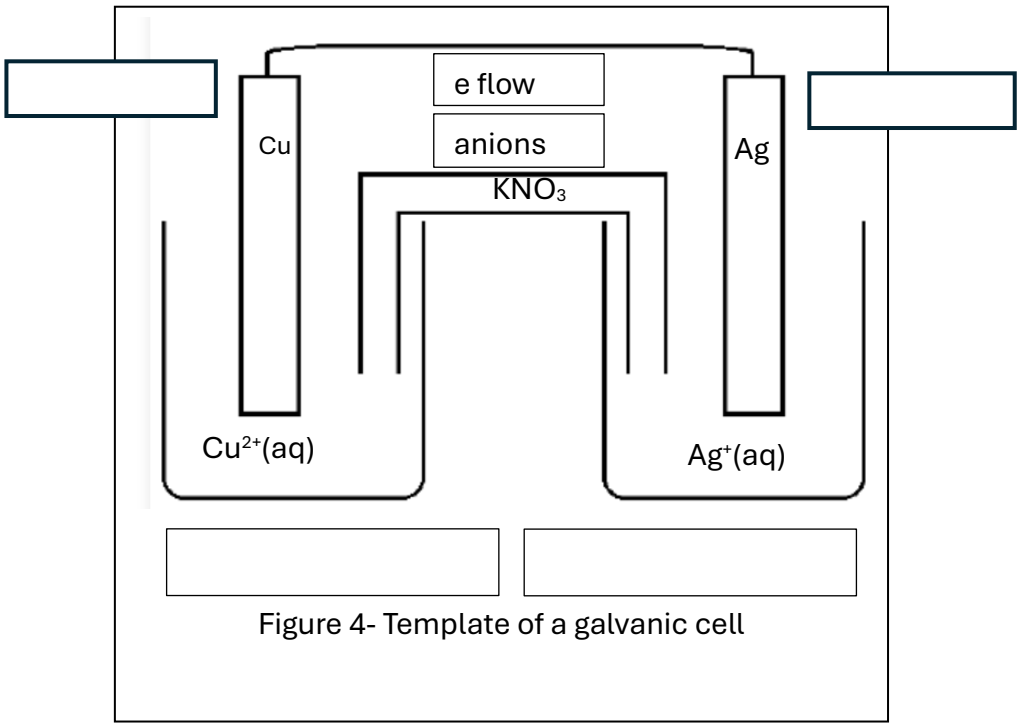

Figure 4- Template of a galvanic cell

a. Label the anode and cathode in the boxes provided in fig. 4

b. Write the oxidation and reduction half equations in the appropriate boxes in the diagram in fig. 4.

c. Indicate on the diagram in fig. 4 the direction of electron flow.

d. Indicate in the box in fig. 4 the direction of anion flow.

e. Using item 2 of the 2026 VCAA Chemistry Data booklet find the EMF of the cell.

f. Write the :

- oxidation reaction _____

- reduction reaction _____

Overall redox equation _____

5. Consider the galvanic cell shown in fig. 5.

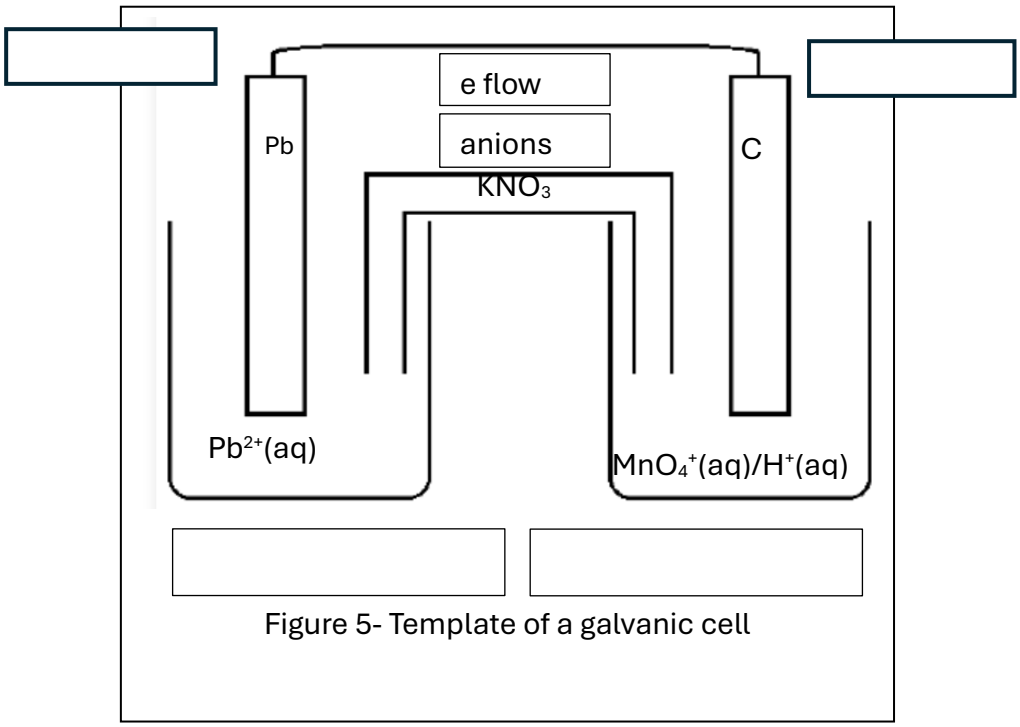

Figure 5- Template of a galvanic cell

a. Label the anode and cathode in the boxes provided in fig. 5

b. Write the oxidation and reduction half equations in the appropriate boxes in the diagram in fig. 5.

c. Indicate on the diagram in fig. 5 the direction of electron flow.

b. Indicate in the box in fig. 5 the direction of anion flow.

d. Using item 2 of the 2026 VCAA Chemistry Data booklet, find the EMF of the cell.

e. Write the :

- oxidation reaction _____

- reduction reaction _____

Overall redox equation _____