Determining the effect of electrolyte concentration of the voltage produced by galvanic cells

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1 Rationale

1.1 Background

Redox

Redox reactions are reactions that involve the transfer of electrons between atoms. These reactions commonly occur within galvanic cells, which within themselves contain two half cells.

Half Cells

Half cells consists of an electrolyte solution and electrode. When two are connected through a load and a salt bridge, one of these half cells will become the anode, where oxidation occurs, and the other will become the cathode, where reduction occurs.

The oxidised cell will transfer its electrons across a wire, where they will then reach and be accepted by the reduced cell.

Each cell has its own standard electrode potential (E^0) which dictates the magnitude of electron emission, or attraction it has under standard lab conditions.

By measuring the difference in magnitude between cells, the overall potential between the cells can be quantified.

$$E^0_{\text{Cell}} = E^0_{\text{Cathode}} - E^0_{\text{Anode}}$$

What is the result of this?

Why does this happen

2 Methodology

2.1 Modifications

The original method is attached as an appendix

2.2 Method

Materials

- 30ml $CuSO_4$ at concentrations 1.00M, 0.85M, 0.70M, 0.55M, 0.40M, 0.30M, 0.20M, 0.10M
- 240ml 1M $ZnSO_4$
- 20ml KNO_3
- Petri dish
- 50ml Beaker - x2
- zinc sheet $\approx$ 4cm $\times$ 6cm
- copper sheet $\approx$ 4cm $\times$ 6cm
- Emery paper
- Filter paper strips $\approx$ 2cm $\times$ 10cm
- Digital Multimeter
- Alligator clips
- Tweezers

Procedure

1.

2.3 Risk assessment