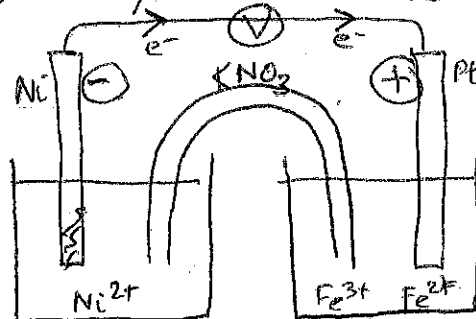
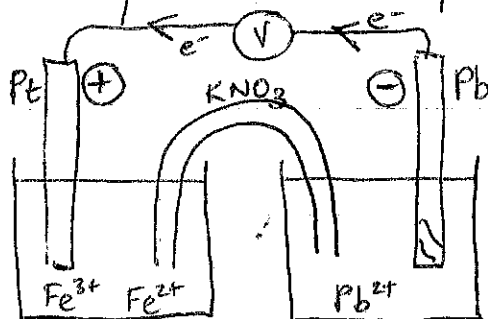
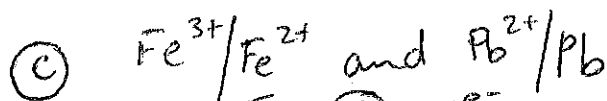
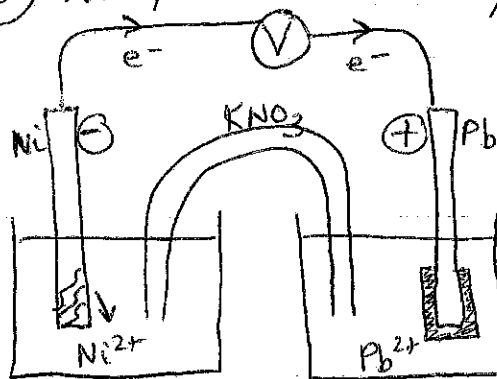
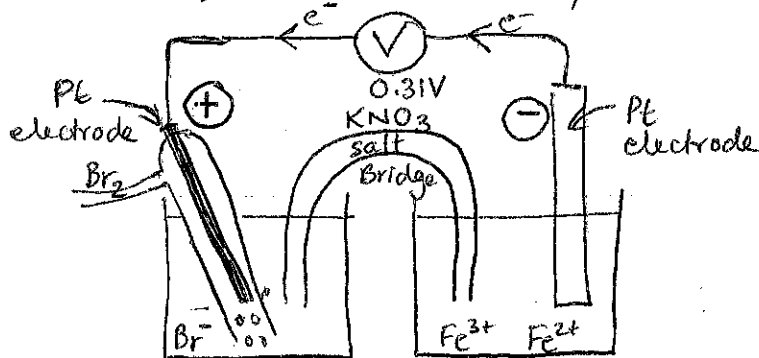
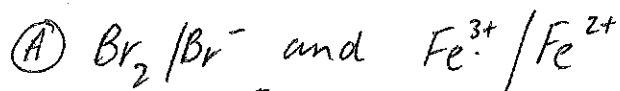


EXPT 103: THE ELECTROCHEMICAL SERIES.

1. PURPOSE

To construct an electrochemical series to compare the relative strengths of bromine, iron(II), iron(III), Pb and Ni.

2. MATERIALS



Solutions of • 1M $\text{Fe}(\text{NO}_3)_3$ / 1M $\text{Fe}(\text{NO}_3)_2$

• 1M $\text{Ni}(\text{NO}_3)_2$

• 1M $\text{Pb}(\text{NO}_3)_2$

• 1M HBr

• 1M KNO_3

(I picked nitrates because on p. 289 of your text, none of these are insoluble.)

3. SAFETY

- When using Br_2 (gas) this should be done under fume cupboard to prevent inhalation.
- Wear gloves as nitrates are irritants and should not touch skin.

4. PROCEDURE

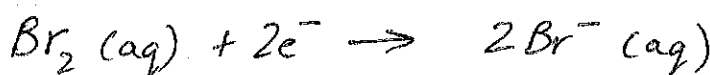
- Connect cells as per diagrams
- record voltage

5. ANALYSIS OF RESULTS

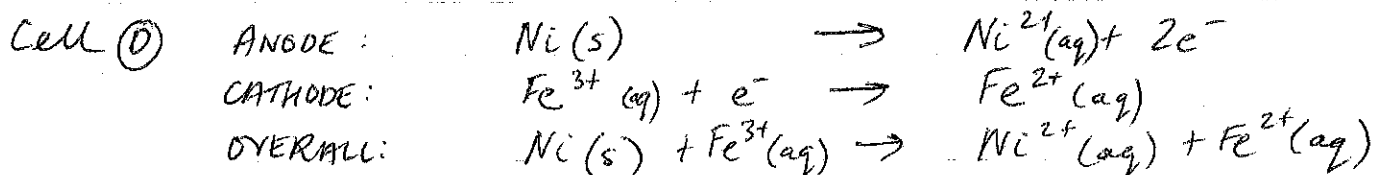
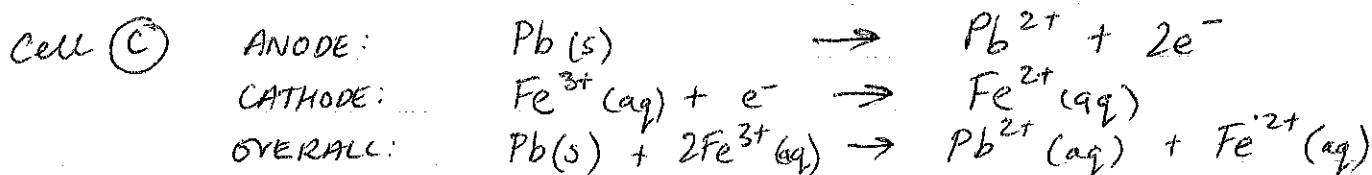
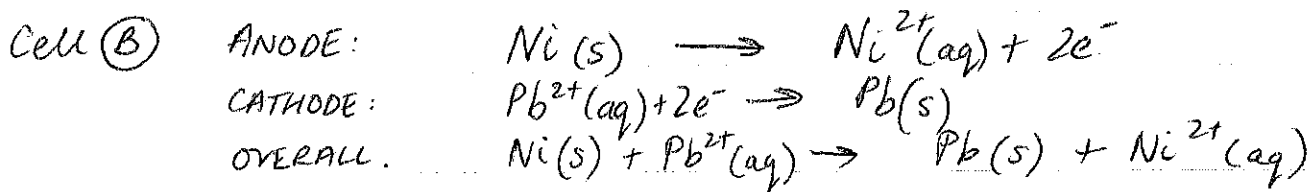
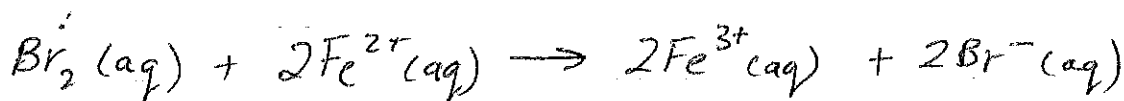
Cell (A) HALF RN AT ANODE ⁽⁻⁾ (OXIDATION IS LOSS)



HALF RN AT CATHODE ⁽⁺⁾ (REDUCTION IS GAIN)



OVERALL RN



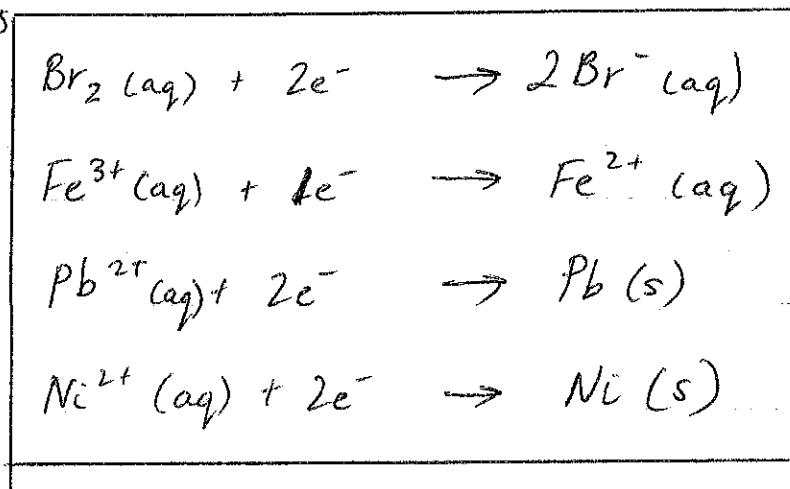
6. CONCLUSION

Cell A.	Cell B	Cell C	Cell D
Br ₂ Fe ³⁺ /Fe ²⁺	Pb Ni	Fe ³⁺ /Fe ²⁺ Pb	Fe ³⁺ /Fe ²⁺ Ni

So electrochemical series is

Br₂ strongest oxidant
 Fe³⁺/Fe²⁺
 Pb
 Ni weakest oxidant

As half-cells



7. EVALUATION

- The order obtained agrees with textbook.
- A different order may be obtained if mismatched concentrations are used. If they are different enough.