

Name: Solutions

Date: _____

1. Determine the oxidation numbers of the underlined element in the following compounds:

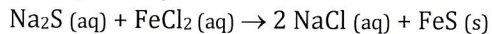
- a. SO₂ +4
- b. MnO₂ +4
- c. Cr³⁺ +3
- d. SO₄²⁻ +6

- e. H₃BO₃ +3
- f. Na2O₂ (sodium peroxide) -1
- g. Sn 0
- h. K2Cr₂O₇ +6

2. Determine the oxidation number of each element in (NH₄)₂CO₃.

N -3 C +4
H +1 O -2

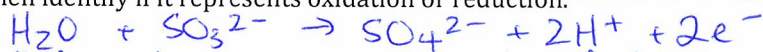
3. Is this a redox reaction? Explain why or why not.



no - no oxidation number changes

4. Balance each of the following half-reactions, then identify if it represents oxidation or reduction.

a. SO₃²⁻ → SO₄²⁻ in acidic conditions



b. CrO₄²⁻ → Cr₂O₇²⁻ in basic conditions



c. 2 I⁻ → I₂



5. Balance each reaction using half-reactions.

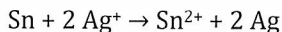
a. NO + As → N₂O + AsO₂⁻ (in acidic conditions)



b. Ce⁴⁺ + I⁻ → Ce³⁺ + IO₃⁻ (in basic conditions)



6. The net equation for a voltaic cell is:



a. Write the two half-reactions involved, and identify the anode and cathode.

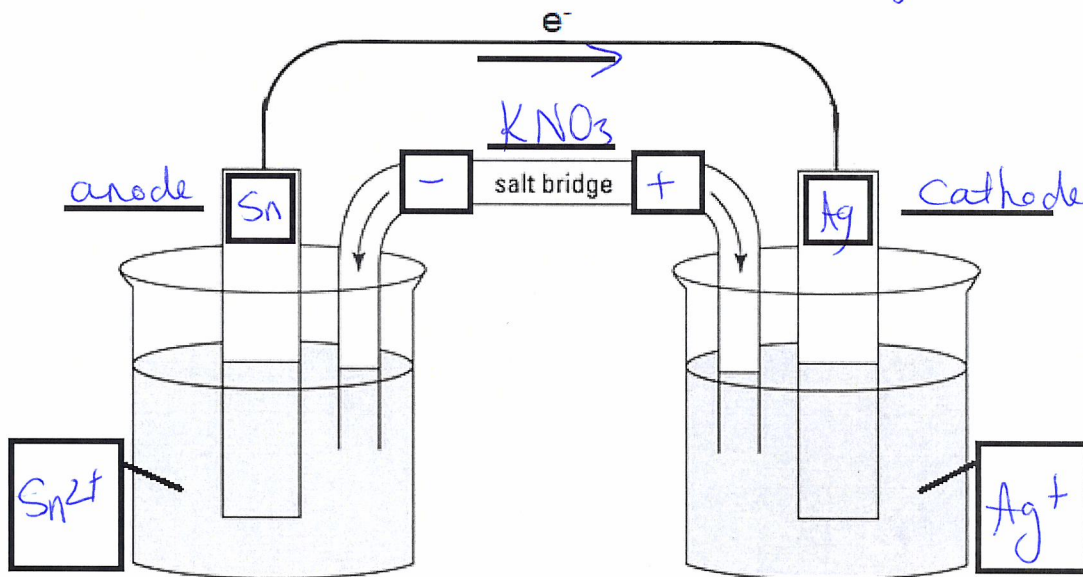


b. Calculate the net potential of the cell in standard conditions.



c. Fill in the diagram of the cell below.

↑
Cathode



$$\begin{aligned} E_{\text{cell}}^{\circ} &= E_{\text{red}}^{\circ} - E_{\text{ox}}^{\circ} \\ &= 0.7991 - (-0.136) \\ &= 0.9351 \text{ V} \end{aligned}$$