891.

I Get a Charge out of You!!

[76 marks]

49 79%
48 77%
62

KU 24/35

Communication [3 marks]

1. What is a salt bridge? What two purposes does it serve? [3 marks]

A salt bridge is a glass u-shaped bridge that is between the beakers and it contains cotton balls in electrolyte soln. The 2 purposes it serves is firstly to maintain electrical neutrality and secondly it acts as a switch for the circuit and between the beakers, and its contents.

3

Making Connections [3 marks]

2. Are metals usually oxidizing agents or reducing agents? Explain your reasoning fully. [3 marks]

Metals tend to lose e^- and bic of this, it makes them undergo oxidation and bic they undergo oxidation, they are reducing agents,

3

+1

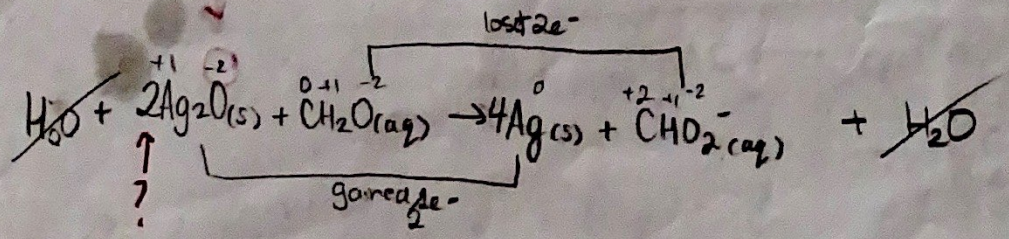
Inquiry [21 marks] 18

3. Balance the following equation, in basic solution, using the oxidation number method. [5 marks]

$Ag_2O(s) + CH_2O(aq) \rightarrow Ag(s) + CHO_2^-(aq)$ in basic solution

Answer: $2Ag_2O_{(s)} + CH_2O_{(aq)} \longrightarrow 4Ag_{(s)} + CHO_2^-{}_{(aq)} + OH^-$

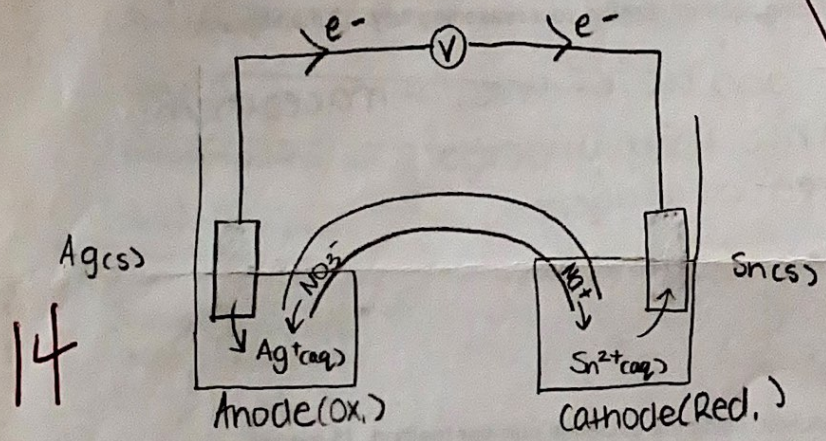
4



4. In an experiment, the silver-tin galvanic cell is set up. anode cathode
(a) Draw a diagram of this galvanic cell. Include beakers, salt bridge (containing sodium nitrate), specific electrodes, specific electrolytes, external circuit and voltmeter. [4 marks]
(b) Indicate the direction of electron flow on the diagram. [1 mark]
(c) Indicate the direction of ion flow from the salt bridge on the diagram. [1 mark]
(d) Label the anode and cathode on the diagram. [2 marks]
(e) Write out the half cell reactions occurring at each electrode, under the appropriate compartment. Include the standard half cell potentials with the half cell reactions. [4 marks]
(f) Write out the overall net cell reaction. [2 marks]
(g) Calculate the standard cell potential. [2 marks]

$Ag(s) \rightarrow Ag^+(aq) + e^-$ → Anode (oxidation) $E^\circ_{ox} = -0.799\ V$

$Sn^{2+}(aq) + 2e^- \rightarrow Sn(s)$ → Cathode (Reduction) $E^\circ_{red} = -0.136\ V$



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$Ag(s) \rightarrow Ag^+(aq) + e^-$

$E^\circ_{ox} = -0.799V$

$Sn^{2+}(aq) + 2e^- \rightarrow Sn(s)$

$E^\circ_{red} = -0.136V$

$2Ag(s) \rightarrow 2Ag^+(aq) + 2e^-$ $\quad E^\circ_{ox} = -0.799\ V$

$Sn^{2+}(aq) + 2e^- \rightarrow Sn(s)$ $\quad E^\circ_{red} = -0.136V$

$2Ag(s) + Sn^{2+}(aq) \rightarrow 2Ag^+(aq) + Sn(s)$ $\quad E\ cell^\circ = 0.935\ V$