

Unit 3 Test Review: Class version *questions out of order! *

#3.) $9.53 \text{ g Cu} \times \frac{1 \text{ mol Cu}}{63.55 \text{ g Cu}} \times \frac{2 \text{ mol } e^-}{1 \text{ mol Cu}} = \boxed{0.30 \text{ mol } e^-}$

because Cu_3N_2
 $\Rightarrow \text{Cu}^{2+} (\text{N}^{3-})$

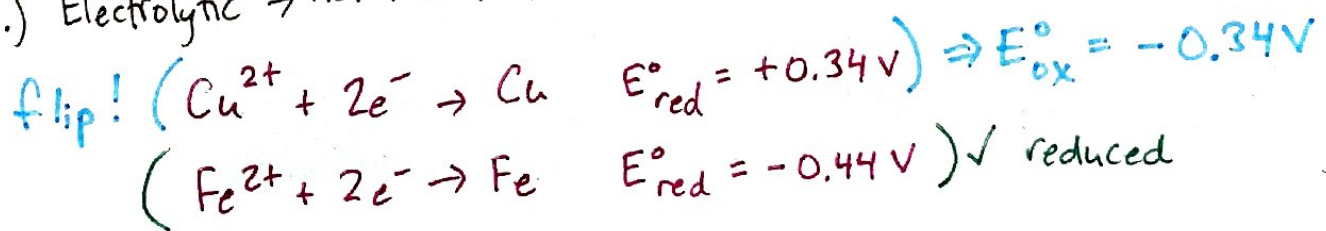
#6.) 1 Faraday = 1 mol e^-

CuNO_3 : $1 \text{ mol } e^- \times \frac{1 \text{ mol Cu}}{1 \text{ mol } e^-} \times \frac{63.55 \text{ g Cu}}{1 \text{ mol Cu}} = \boxed{63.55 \text{ g Cu}}$ greatest mass
 $\hookrightarrow \text{Cu}^+$

$\text{Cu}(\text{NO}_3)_2$: $1 \text{ mol } e^- \times \frac{1 \text{ mol Cu}}{2 \text{ mol } e^-} \times \frac{63.55 \text{ g}}{1 \text{ mol}} = \frac{63.55 \text{ g}}{2}$
 \downarrow
 Cu^{2+}

$\text{Cu}(\text{NO}_3)_3$: $1 \text{ mol } e^- \times \frac{1 \text{ mol Cu}}{3 \text{ mol } e^-} \times \frac{63.55 \text{ g}}{1 \text{ mol}} = \frac{63.55 \text{ g}}{3}$
 \downarrow
 Cu^{3+}

#6.) Electrolytic \Rightarrow not therm. fav!



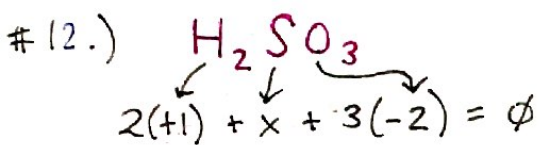
$E_{\text{cell}}^\circ = -0.34 - 0.44 = -0.78 \text{ V}$

An ox \Rightarrow anode = Cu(s)

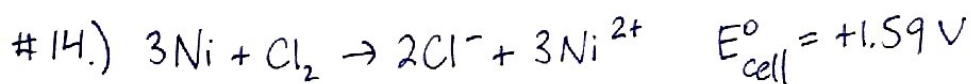
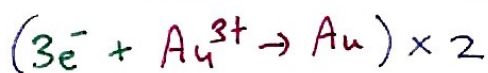
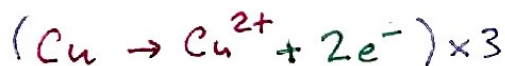
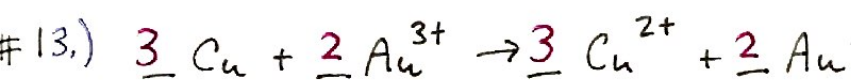
Red cat \Rightarrow cathode = Fe(s)

$$\#11.) 30. \text{ mL} \times 0.10 \text{ M} = 3.00 \text{ mmol } \text{KMnO}_4 \times \frac{5 \text{ mol } \text{H}_2\text{O}_2}{2 \text{ mol } \text{MnO}_4^-} = 7.50 \text{ mmol } \text{H}_2\text{O}_2$$

$$[\text{H}_2\text{O}_2] = \frac{7.50 \text{ mmol}}{40. \text{ mL}} = \boxed{0.19 \text{ M}}$$



$$2 + x - 6 = 0 \Rightarrow x - 4 = 0 \Rightarrow x = \boxed{+4}$$



$$E^\circ_{\text{cell}} = E^\circ_{\text{ox}} + E^\circ_{\text{red}}$$

$$1.59 = E^\circ_{\text{ox}} + 1.36 \Rightarrow E^\circ_{\text{ox}}(\text{Ni}) = 1.59 - 1.36 = +0.23 \text{ V}$$

$$\Rightarrow E^\circ_{\text{red}}(\text{Ni}) = \boxed{-0.23 \text{ V}}$$

$$\#16.) 2.0 \text{ min} \times \frac{60 \text{ s}}{1 \text{ min}} \times \frac{10.3 \text{ C}}{\text{s}} \times \frac{1 \text{ mole } e^-}{96,485 \text{ C}} \times \frac{1 \text{ mol Ni}}{2 \text{ mole } e^-} \times \frac{58.69 \text{ g Ni}}{1 \text{ mol Ni}}$$

