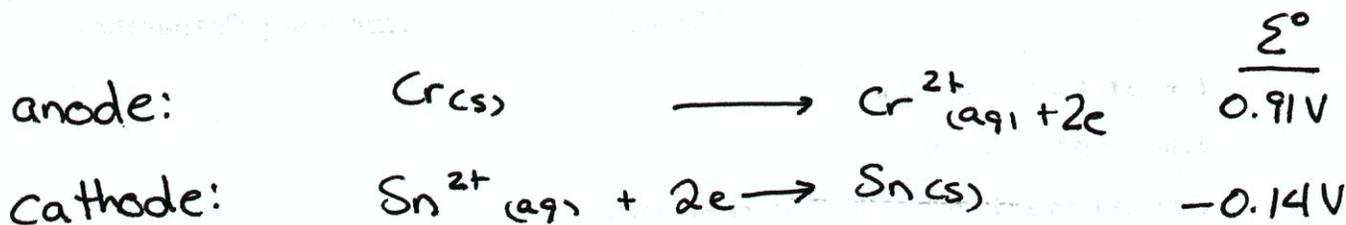
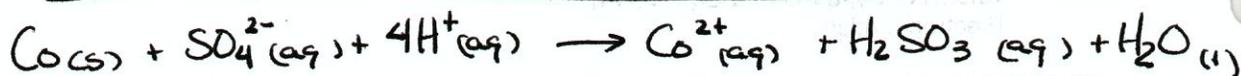
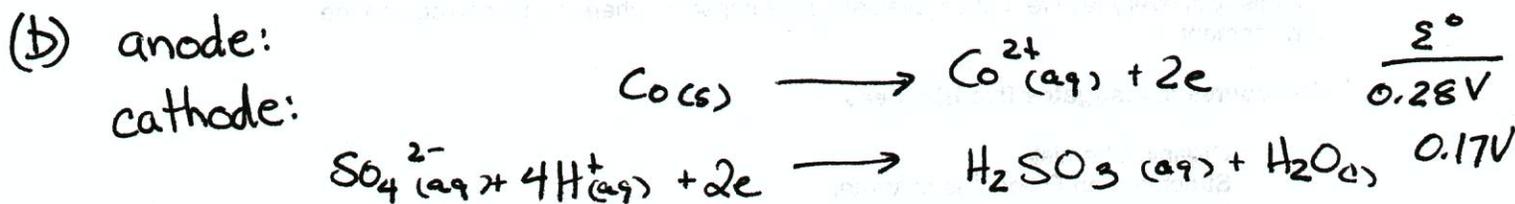


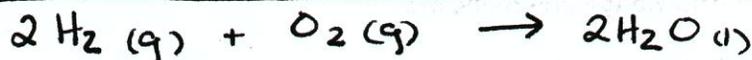
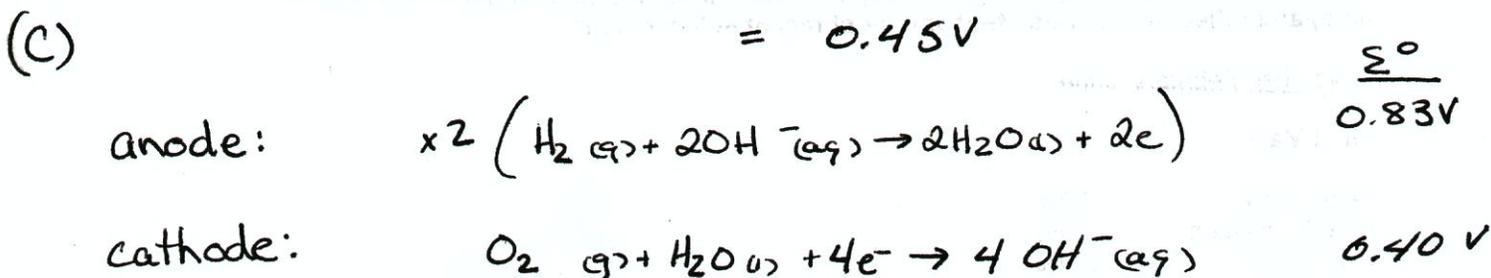
10(a)



$$\begin{aligned} \Sigma^{\circ}_{\text{cell}} &= \Sigma^{\circ}_{\text{red}} + \Sigma^{\circ}_{\text{oxid}} \\ &= 0.91\text{V} - 0.14\text{V} \\ &= 0.77\text{V} \end{aligned}$$



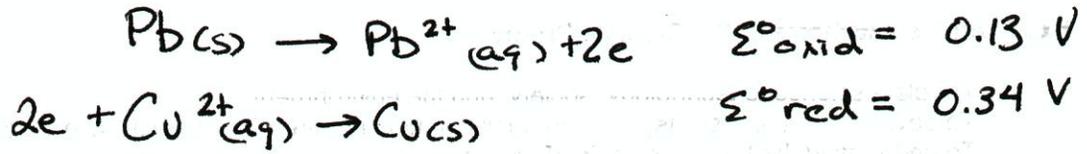
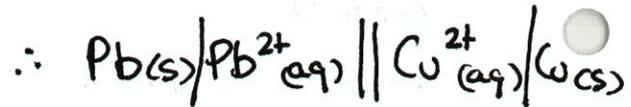
$$\begin{aligned} \Sigma^{\circ}_{\text{cell}} &= \Sigma^{\circ}_{\text{red}} + \Sigma^{\circ}_{\text{oxid}} \\ &= 0.17\text{V} + 0.28\text{V} \\ &= 0.45\text{V} \end{aligned}$$



$$\begin{aligned} \Sigma^{\circ} &= \Sigma^{\circ}_{\text{red}} + \Sigma^{\circ}_{\text{oxid}} \\ &= 0.40\text{V} + 0.83\text{V} \\ &= 1.23\text{V} \end{aligned}$$

11. a) copper-lead

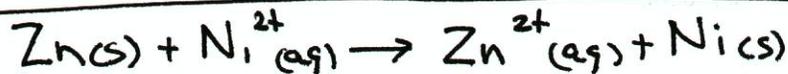
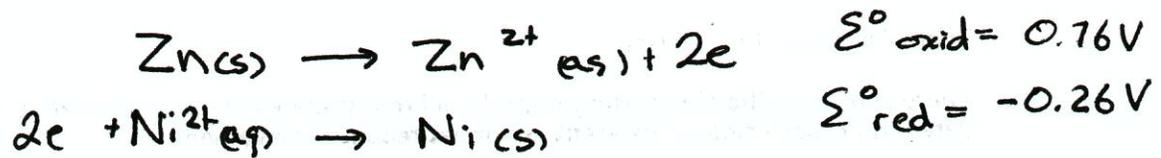
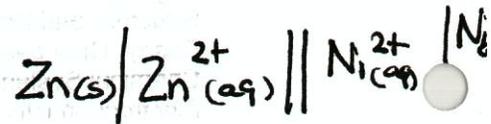
cathode Cu(s)
lead
anode Pb(s)



$$\begin{aligned} \Sigma^{\circ}_{\text{cell}} &= \Sigma^{\circ}_{\text{red}} + \Sigma^{\circ}_{\text{oxid}} \\ &= 0.34 \text{ V} + 0.13 \text{ V} \\ &= 0.47 \text{ V} \end{aligned}$$

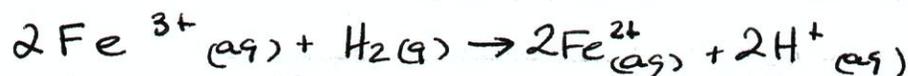
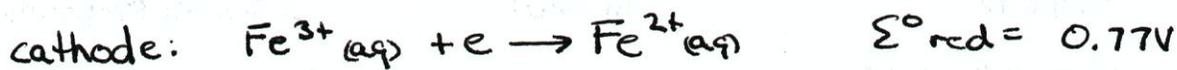
b) nickel zinc

cathode: Ni(s)
anode: Zn(s)



$$\begin{aligned} \Sigma^{\circ}_{\text{cell}} &= \Sigma^{\circ}_{\text{red}} + \Sigma^{\circ}_{\text{oxid}} \\ &= -0.26 \text{ V} + 0.76 \text{ V} \\ &= 0.50 \text{ V} \end{aligned}$$

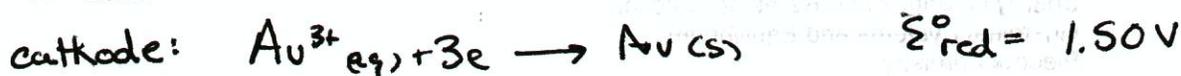
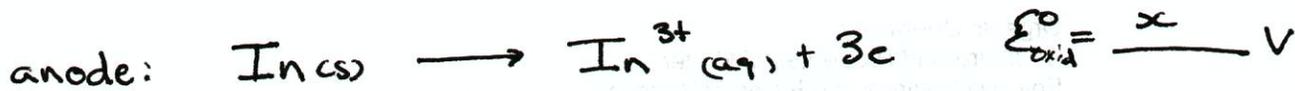
(C) iron (III) - hydrogen



$$\Sigma^{\circ}_{\text{cell}} = \Sigma^{\circ}_{\text{red}} - \Sigma^{\circ}_{\text{oxid}}$$
$$= 0.77\text{V}$$

$\text{Pt}(\text{s}) \mid \text{H}_2(\text{g}), \text{H}^{+} \parallel \text{Fe}^{3+}, \text{Fe}^{2+} \mid \text{Pt}(\text{s})$

12.



$$\Sigma^{\circ}_{\text{cell}} = \Sigma^{\circ}_{\text{red}} + \Sigma^{\circ}_{\text{oxid}}$$

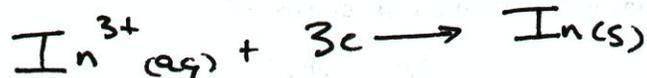
$$1.84\text{V} = 1.50\text{V} + x$$

$$x = 0.34\text{V}$$

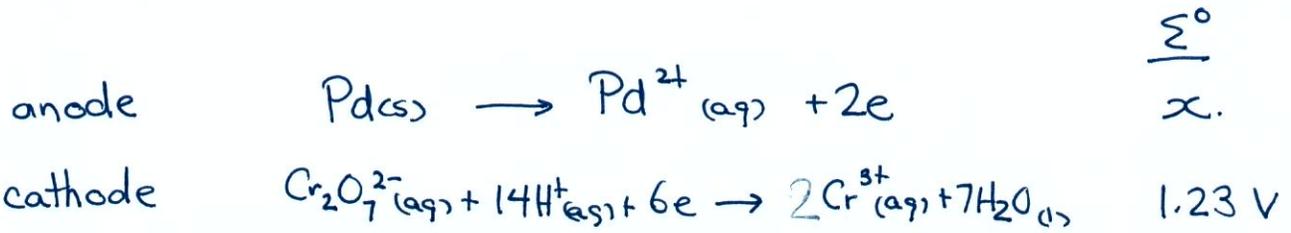
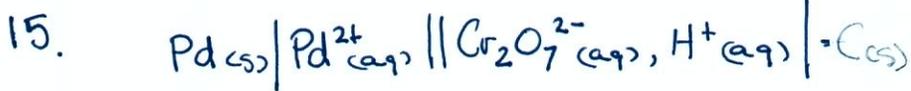
$$\therefore \Sigma^{\circ}_{\text{oxid}} = 0.34\text{V}$$

so

$\Sigma^{\circ}_{\text{red}}$ for



$$\Sigma^{\circ}_{\text{red}} = -0.34\text{V}$$

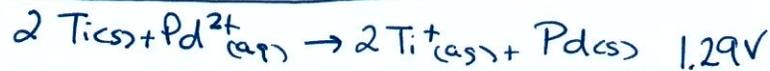
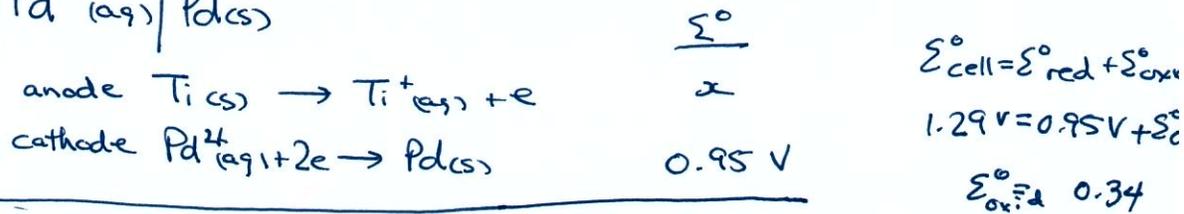
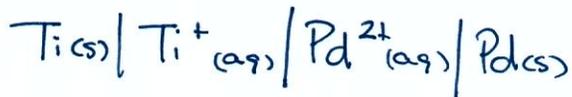


$$\Sigma^\circ_{\text{cell}} = \Sigma^\circ_{\text{red}} + \Sigma^\circ_{\text{oxid}}$$

$$0.28\text{V} = 1.23\text{V} + \Sigma^\circ_{\text{oxid}}$$

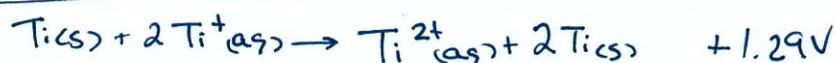
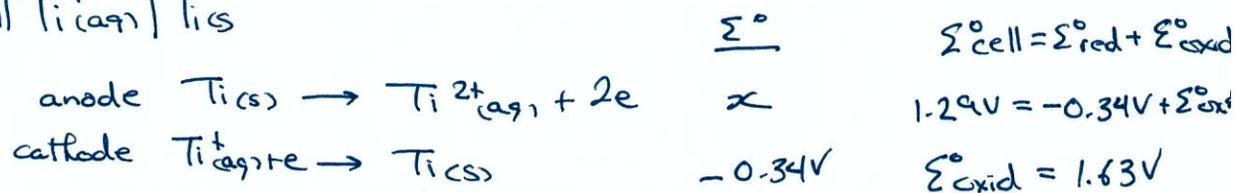
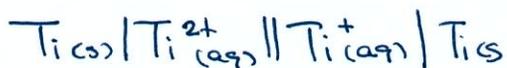
$$\Sigma^\circ_{\text{oxid}} = -0.95\text{V}$$

$$\therefore \Sigma^\circ_{\text{red}} = 0.95\text{V} \text{ for } \text{Pd}^{2+}(\text{aq}) + 2e \rightarrow \text{Pd(s)}$$

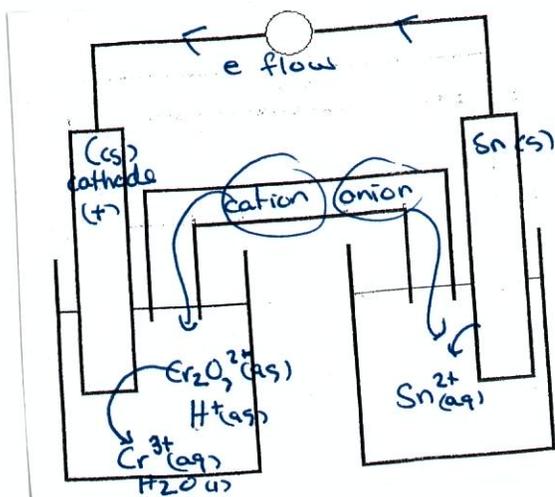
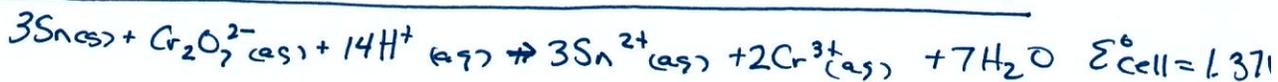
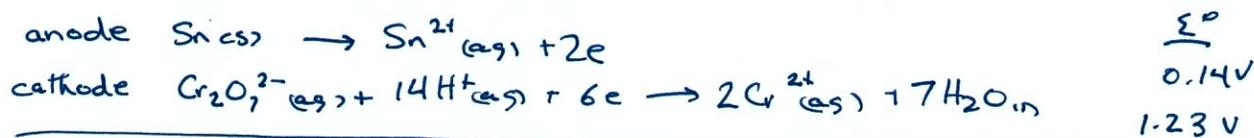
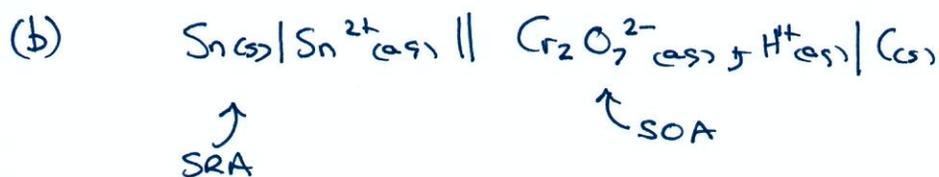
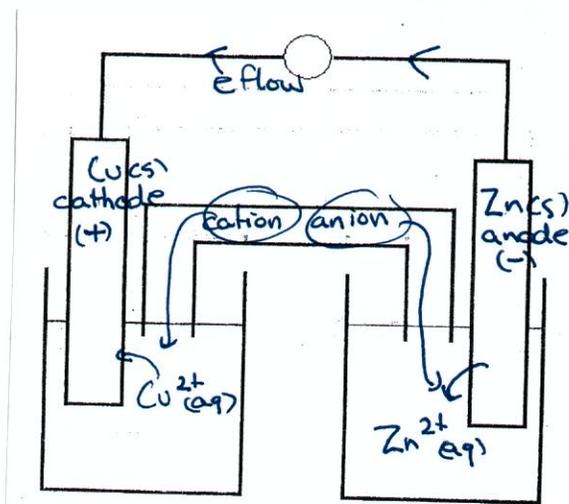
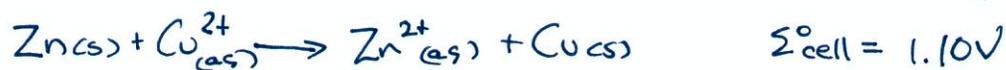
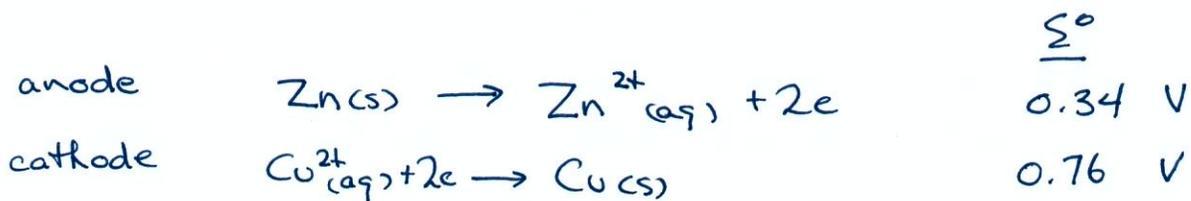
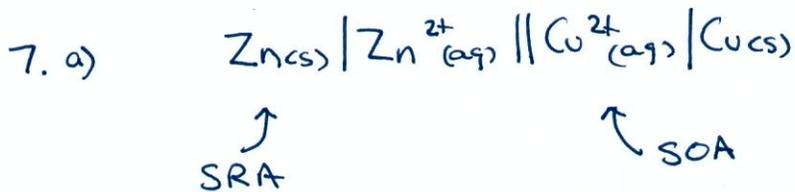


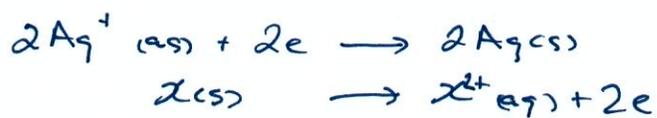
$$\therefore \Sigma^\circ_{\text{red}} \text{ for } \text{Ti}^+(\text{aq}) + e \rightarrow \text{Ti(s)}$$

$$\Sigma^\circ_{\text{red}} = -0.34\text{V}$$



$$\therefore \Sigma^\circ_{\text{red}} = -1.63\text{V} \text{ for } \text{Ti}^+(\text{aq}) + e \rightarrow \text{Ti(s)}$$





$$\begin{array}{r} \Sigma^\circ \\ 0.80\text{V} \\ \text{X} \end{array}$$



$$\Sigma^\circ_{\text{cell}} = 1.08\text{V}$$

$$\Sigma^\circ_{\text{cell}} = \Sigma^\circ_{\text{red}} + \Sigma^\circ_{\text{oxid}}$$

$$1.08\text{V} = 0.8\text{V} + \Sigma^\circ_{\text{oxid}}$$

$$\Sigma^\circ_{\text{oxid}} = 0.28\text{V}$$

$$\therefore \Sigma^\circ_{\text{red}} \text{ for } \text{X}^{2+}(\text{aq}) + 2e \rightarrow \text{X}(\text{cs})$$

is -0.28V

$$\therefore \text{X is Co}$$

