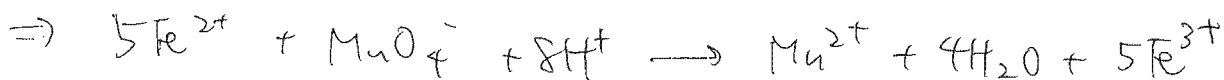
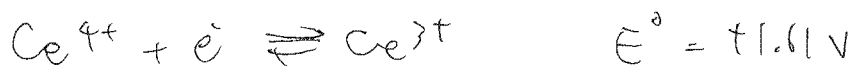
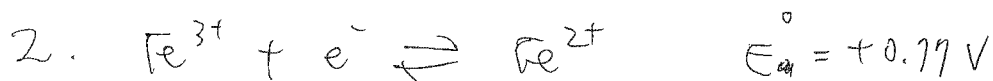


$E^\circ$  が負の酸化剤 Fe<sup>2+</sup> が電子を放出

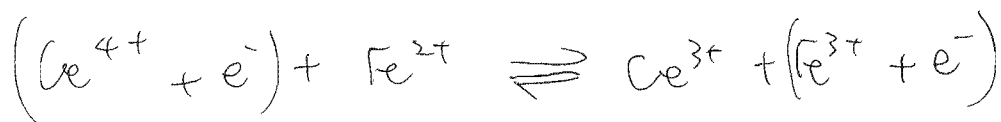
$E^\circ$  が正の酸化剤  $\text{MnO}_4^-$  が電子を受け取る



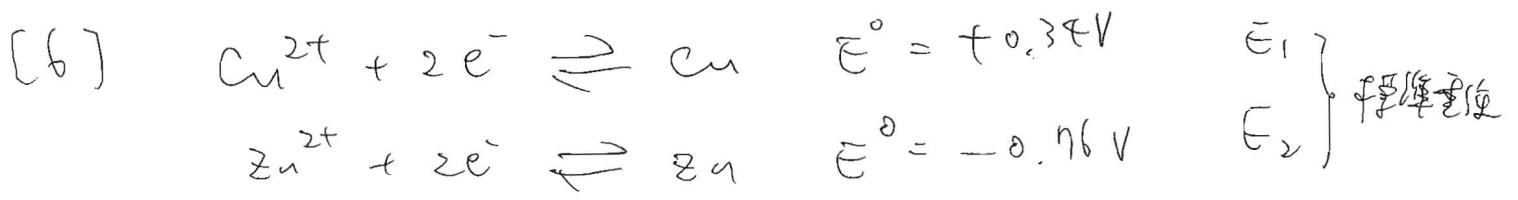
5, 2 係に合わせる



$E^\circ$  が正の酸化剤  $\text{Ce}^{4+}$  が電子を受け取る → Fe は電子を放出  
↑  
酸化剤



反応は Fe に合わせる



$$\text{Cu: } E_1 = 0.34 - \frac{0.0592}{2} \log_{10} \frac{a(\text{Cu}^{2+})}{a(\text{Cu})}$$

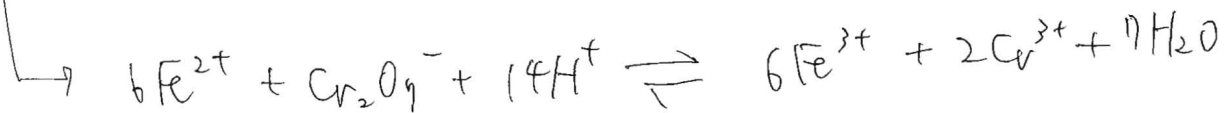
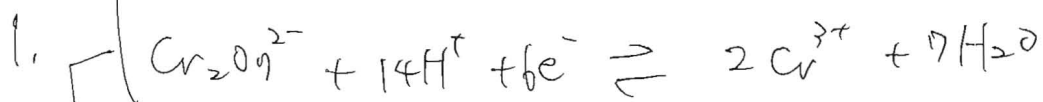
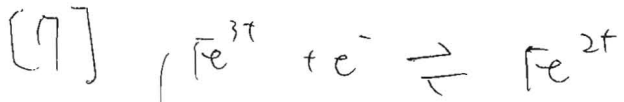
$$E_2 = -0.76 - \frac{0.0592}{2} \log_{10} \frac{a(\text{Zn})}{a(\text{Zn}^{2+})}$$

$$\text{計算} \quad \Delta E = E_1 - E_2 = 0.34 - (-0.76) + \frac{0.0592}{2} \log_{10} \frac{a(\text{Cu}^{2+})a(\text{Zn})}{a(\text{Cu})a(\text{Zn}^{2+})}$$

$$\text{固体は } a(\text{Cu}) = a(\text{Zn}) = 1 \quad \text{と仮定}$$

$$\Delta E = E_1 - E_2 = 1.10 + \frac{0.0592}{2} \log_{10} \frac{a(\text{Cu}^{2+})}{a(\text{Zn}^{2+})}$$

$$= 1.10 + \frac{0.0592}{2} \log_{10} \frac{0.2}{1.8} = 1.07 \text{ V}$$



$$2. \quad 0.00500 \text{ mol/L} \times 0.01500 \text{ L} \times 6 = \underline{\underline{4.50 \times 10^{-4} \text{ mol}}}$$

[8]

$$1. E = E_0^{\circ} + \frac{RT}{2F} \ln \frac{[O_2][H^+]^2}{[H_2O_2]}$$

$$E = E_{Mn}^{\circ} + \frac{RT}{5F} \ln \frac{[MnO_4^-][H^+]^8}{[Mn^{2+}]}$$

$$2. E = E_0^{\circ'} + \frac{RT}{2F} \ln \frac{[O_2]}{[H_2O_2]}, \quad E_0^{\circ'} = E_0^{\circ} + \frac{RT}{5F} \ln [H^+]$$

$$E = E_{Mn}^{\circ'} + \frac{RT}{5F} \ln \frac{[MnO_4^-]}{[Mn^{2+}]}, \quad E_{Mn}^{\circ'} = E_{Mn}^{\circ} + \frac{8RT}{5F} \ln [H^+]$$

$$3. E_0^{\circ'} = 0.682 V + 0.0592 \cdot \log 0.5 = 0.664 V$$

$$E_{Mn}^{\circ'} = 1.51 V + 0.0592 \cdot \log 0.5 = 1.48 V$$

$$4. E_{equiv.} = \frac{2E_0^{\circ'} + 5E_{Mn}^{\circ'}}{2+5} = \frac{2 \times 0.664 + 5 \times 1.48}{7} = 1.25 V //$$