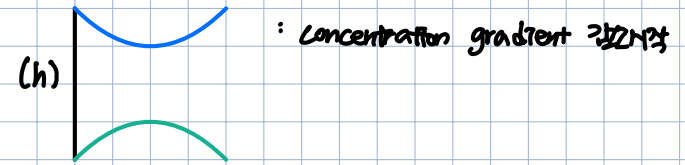
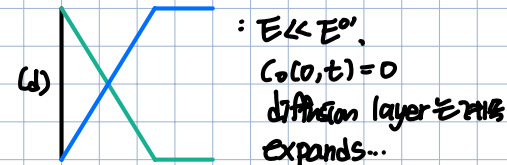
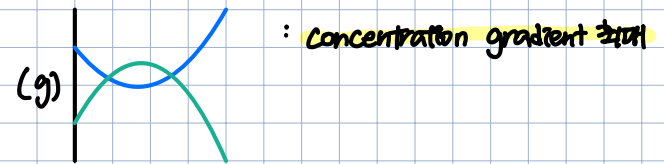
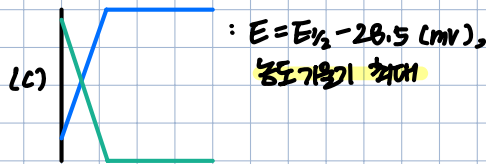
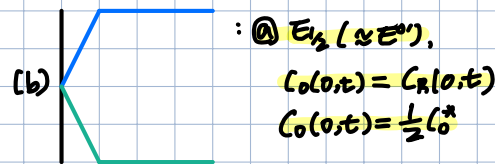
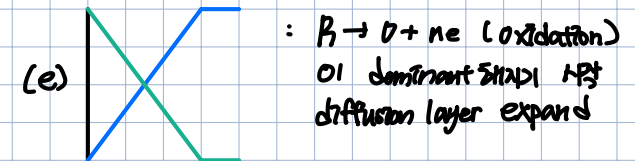
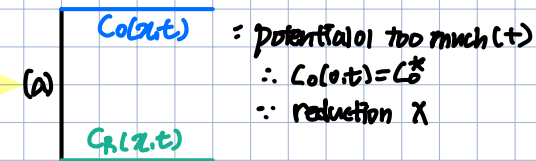
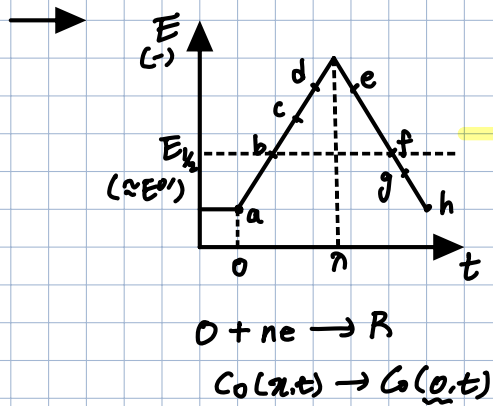


17. Cyclic voltammetry

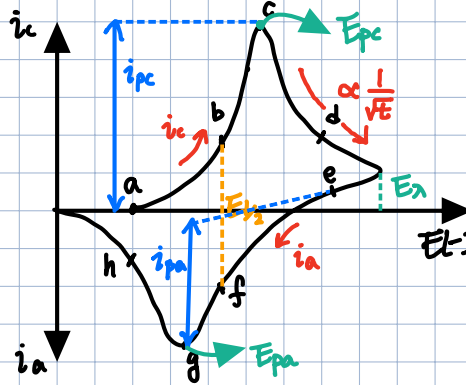
1. Review

- LSV's Faradaic current: $i = nFA C_0^* (\pi D \omega)^{1/2} \chi(\omega t)$
- LSV's non-Faradaic current: $i = v C_d [1 - \exp(-t/R_s C_d)]$

2. Cyclic voltammetry (CV)

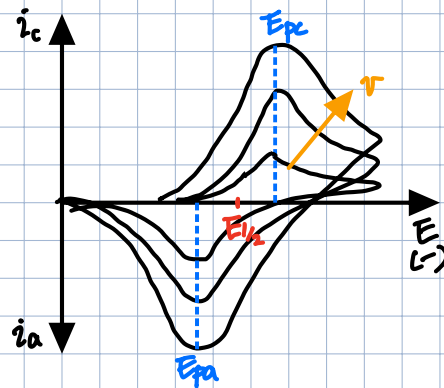


LSV



- ① interference of changing current & baseline
- ② electrode reaction or ~~just~~ chemical reaction & reaction mechanism ~~이것~~

→ ① In the case of Nernstian (electrochemically reversible system)



$$① E_{pc} = E_{1/2} - \frac{28.5}{n} \text{ (mV)} \quad \& \quad E_{pa} = E_{1/2} + \frac{28.5}{n} \text{ (mV)}$$

$$\therefore \Delta E_p = E_{pc} - E_{pa} = \frac{57}{n} \text{ (mV)}$$

$$② i_{pc} = i_{pa}$$

$$③ i_p \propto \sqrt{v}$$

$$④ \alpha_n < \alpha_f$$

↳ R is diffuse out, 즉 R의 일부분만 $R \rightarrow O + e$ 반응

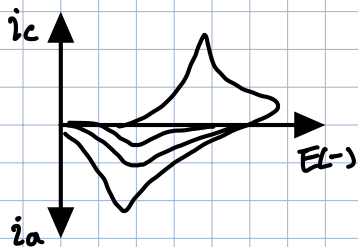
② In the case of non-Nernstian,

↳ forward scan : moves to negative direction & decrease

reverse scan : moves to positive direction & decrease

$$\therefore \Delta E_p > \frac{57}{n} \text{ (mV)}$$

③ Application of CV: "EC mechanism"



⊗ assumption: $O + ne = R$ & $R \xrightarrow{k} X$

$$1) v \uparrow \Rightarrow i_a \uparrow$$

$$2) k \uparrow \Rightarrow i_a \uparrow$$