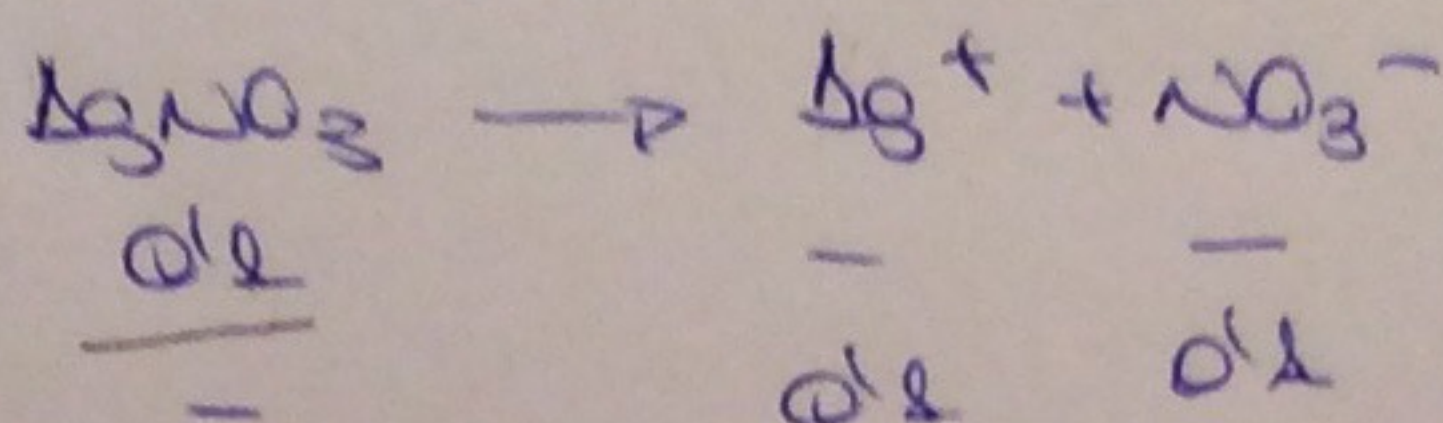
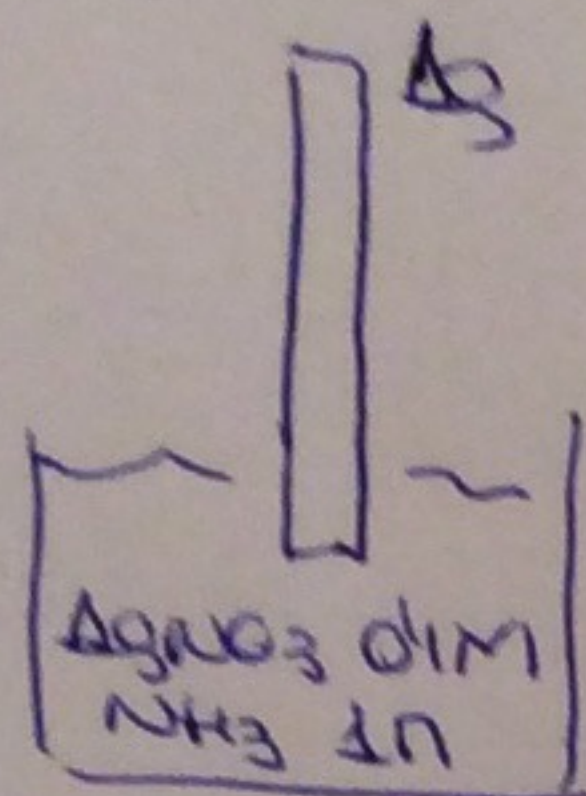


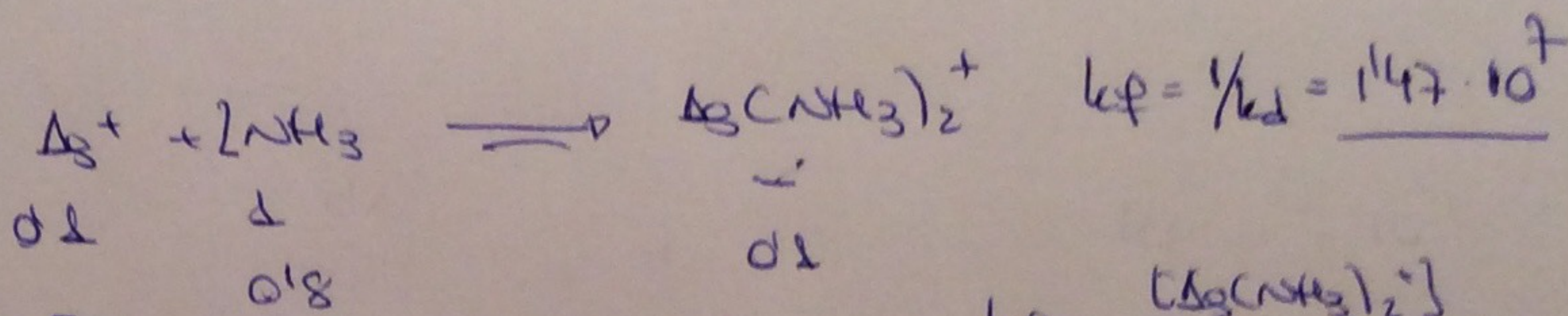
Calcular la diferencia de potencial de un electrodo de plata introducido en una disolución obtenida al mezclar volúmenes iguales de AgNO_3 0.1M y de NH_3 1M .

Constante de disociación del complejo amoniacal $K_d(\text{NH}_3)_2^+ = 6.8 \cdot 10^{-8}$

$$E^\circ(\text{Ag}^+/\text{Ag}) = 0.799\text{V}$$



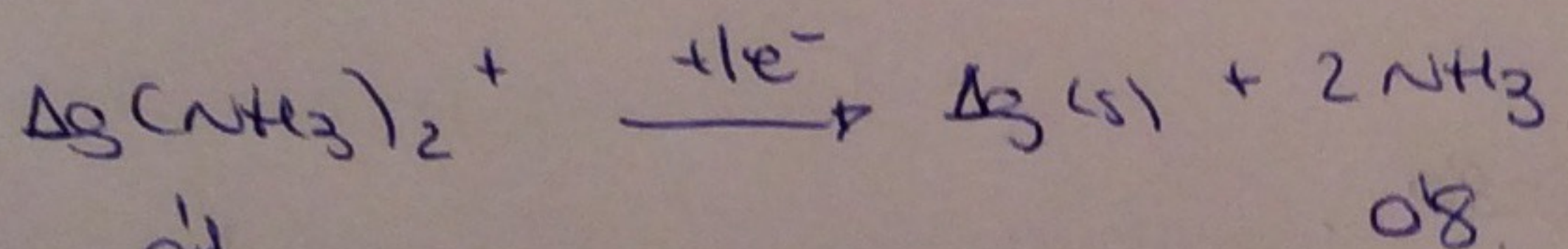
AgNO_3 sol muy soluble



$$K_f = 1/K_d = 1.47 \cdot 10^7$$

$$K_f = \frac{[\text{Ag}(\text{NH}_3)_2^+]}{[\text{Ag}^+][\text{NH}_3]^2}$$

→ entonces realmente el electrodo es:



NO EQUILIBRIO

(*) En el equilibrio

$$E_p = E^\circ - \frac{2T}{nF} \ln \frac{[\text{NH}_3]^2}{[\text{Ag}(\text{NH}_3)_2^+]} \cdot \frac{[\text{Ag}^+]}{[\text{Ag}^+]} = E^\circ - \frac{2T}{nF} \ln \frac{1}{K_f [\text{Ag}^+]}$$

Para determinar $[\text{Ag}^+]$ en equilibrio considero $E^\circ(\text{Ag}^+/\text{Ag}) = 0.799\text{V}$

$$E = E^\circ - \frac{2T}{nF} \ln \frac{1}{[\text{Ag}^+]} \rightarrow 0 = 0.799 - \frac{8.314 \cdot 298}{1 \cdot 96500} \ln \frac{1}{[\text{Ag}^+]} \rightarrow [\text{Ag}^+] = 3.05 \cdot 10^{-14}\text{M}$$

Sustituyendo

$$0 = E^\circ - \frac{8.314 \cdot 298}{96500} \ln \frac{1}{1.47 \cdot 10^7 \cdot 3.05 \cdot 10^{-14}} \rightarrow E^\circ = 0.875\text{V}$$

⊛ En las condiciones del problema

$$E = E^{\circ} - \frac{RT}{nF} \ln \frac{[NH_3]^2}{[Ag(NH_3)_2]^+} = 0.375 - \frac{8.314 \cdot 298}{96500} \ln \frac{0.82}{0.1}$$

$$E = 0.3273V$$