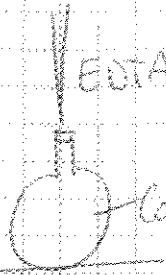


Regneoppgave høst 2007



EDTA: 0.02 M

$[Ca^{2+}] = 0.03 M$



↳ 0.02 M ved ekv.

$$[Ca^{2+}]_{ekv} = 1.5 \cdot 10^{-7}$$

pH 12 $\gamma(11)$

$$T = ([X^{4-}] + [HX^{3-}] - [Ca^{2+}])_{ekv}$$

$$\frac{[H^+][X^{4-}]}{[HX^{3-}]} = 5.5 \cdot 10^{-11} \quad \text{og} \quad \frac{[CaX^{2-}]}{[Ca^{2+}][X^{4-}]} = 5 \cdot 10^{10}$$

Ved pH 12 $\frac{10^{-12} [X^{4-}]}{[HX^{3-}]} = 5.5 \cdot 10^{-11}$ pH 11

$$\text{og} \quad \frac{[X^{4-}]}{[HX^{3-}]} = 55 \quad 5,5$$

$$\frac{0.02}{1.5 \cdot 10^{-7} \cdot [X^{4-}]} = 5 \cdot 10^{10}$$

$$[X^{4-}] = 27 \cdot 10^{-6}$$

$$3.0 \cdot 10^{-6}$$

$$T = 27 \cdot 10^{-6} \checkmark + \frac{27 \cdot 10^{-6} \checkmark}{55} - 1.5 \cdot 10^{-7} \checkmark = 2.6 \cdot 10^{-6} \checkmark$$

$$T_0 = \frac{2.6 \cdot 10^{-6} \checkmark}{0.02 \checkmark} \cdot 100\% = \begin{matrix} 0.013\% \\ 0.015\% \end{matrix}$$

$$T = 0 \quad ([X^{4-}] + [HX^{3-}] - [Ca^{2+}]) \quad \text{sett} \quad [Ca^{2+}] = y$$

$$\frac{0.02}{y [X^{4-}]} = 5 \cdot 10^{10} \quad [X^{4-}] = \frac{0.02}{y \cdot 5 \cdot 10^{10}}$$

$$[HX^{3-}] = \frac{0.02}{y \cdot 5 \cdot 10^{10}} + \frac{0.02}{y \cdot 5 \cdot 10^{10} \cdot 55} = y$$

$$\frac{0.02 \cdot 56}{y \cdot 5 \cdot 10^{10} \cdot 55} = y \quad \Rightarrow \quad y = \sqrt{\frac{0.02 \cdot 56}{5 \cdot 10^{10} \cdot 55}} = \frac{6.4 \cdot 10^{-7} M}{6.8 \cdot 10^{-7} M}$$