

## Question #82618, Chemistry / General Chemistry | for completion

In a  $1.0 \times 10^{-4}$  M solution of HClO(aq), identify the relative molar amounts of these species.

H<sub>2</sub>O

OH<sup>-</sup>

H<sub>3</sub>O<sup>+</sup>

OCl<sup>-</sup>

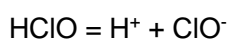
HClO

Answer:

$$K_D = 3 \times 10^{-8} \text{ (HClO)}$$

$$C_M = 1 \times 10^{-4} \text{ M}$$

Formula:



$$K_D = [\text{H}^+] \times [\text{ClO}^-] / [\text{HClO}]$$

$$[\text{H}^+] = [\text{ClO}^-] \text{ therefore } [\text{H}^+]^2 = K_D \times [\text{HClO}] \text{ and } [\text{H}^+] = \sqrt{K_D \times [\text{HClO}]}$$

$$[\text{H}^+] = \sqrt{K_D \times [\text{HClO}]} = \sqrt{3 \times 10^{-8} \times 1 \times 10^{-4}} = 1.73 \times 10^{-6}$$

$$[\text{H}^+] = 1.73 \times 10^{-6} \text{ M} = [\text{H}_3\text{O}^+] = [\text{ClO}^-]$$

$$[\text{H}_2\text{O}] = 55.55$$

$$[\text{HClO}] = 0,00009827 (1 \times 10^{-4} - 1.73 \times 10^{-6})$$

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