

Acids/Bases ③ pH/pOH Calculations ②

① Calculate the pOH of ~~0.00~~ 0.045 M Ba(OH)₂ ②

$$\text{Ba(OH)}_2 \rightarrow \text{Ba}^{2+} + 2\text{OH}^-$$

0.045 M. $(0.045 \times 2) = 0.09 \text{ M}$ find $-\log 0.09$
 $= \boxed{1.05}$

② What is the pH of a solution made by dissolving 0.0105 mol HNO₃ in 225 L H₂O?
 Find conc.

$$\frac{0.0105 \text{ mol}}{0.225 \text{ L}} = 4.67 \times 10^{-5} \text{ M} \text{ take } -\log$$

$$\boxed{4.33}$$

③ The pH of milk of magnesia solution (Mg(OH)₂) is 10.52, what is the molarity of the solution?

$$\text{pH} = 10.52, \quad \text{pOH} = 14 - 10.52 = 3.48$$

$$\text{inv. log } 3.48 = \boxed{3.3 \times 10^{-4} \text{ M}}$$

$$\frac{3.3 \times 10^{-4} \text{ M OH}^- \times 1 \text{ mol Mg(OH)}_2}{2 \text{ mol OH}^-} = \boxed{1.7 \times 10^{-4} \text{ M}}$$

2nd way: pH = 10.52 - calc $\left\{ \text{H}_3\text{O}^+ \right\} = \text{inv. log } 10.52$
 $= 3.02 \times 10^{-11}$

$$K_w = 1. \times 10^{-14}$$

$$\left\{ \text{OH}^- \right\} = \frac{1 \times 10^{-14}}{3.02 \times 10^{-11}} = \boxed{3.3 \times 10^{-4} \text{ M}}$$

$$\boxed{\text{OH}^-}$$