Supra Super — $K_w = [H_3O^+][OH^-] = 1 \times 10^{-14}$

Acids/Bases ② Calculation of pH/pOH ① $[OH^-]/[H_3O^+]$

① What is the pOH of an aq. soln of baking soda of pH 8.4.

* ⓐ ~~14 = 14~~ $14 - 8.4 = \boxed{5.6}$

ⓑ What is the pH of a laundary det. at pOH 3.9

$14 - 3.9 = \boxed{10.1}$

② What is the $[H_3O^+]$ or $[OH^-]$ of the following

* ⓐ $[H_3O^+] = 1.67 \times 10^{-8}$ $[OH^-] = \frac{1.0 \times 10^{-14}}{1.67 \times 10^{-8}} = \boxed{5.99 \times 10^{-7} M}$

ⓑ $[OH^-] = 2.29 \times 10^{-10}$ $[H_3O^+] = \frac{1.0 \times 10^{-14}}{2.29 \times 10^{-10}} = \boxed{4.37 \times 10^{-5}}$

③ Calculate pH or pOH or $[H_3O^+]$ or $[OH^-]$ in the following

* ⓐ pH of 0.0012 M HCl. $pH = -\log [H_3O^+] = -\log 0.0012 = \boxed{2.92}$

ⓑ $[OH^-]$ of a soln of pH = 3.65 $pOH = 14 - 3.65 = 9.65$.

antilog of 9.65 $= \boxed{2.2 \times 10^{-10} M}$

ⓒ pOH of 9.1×10^{-2} M $HClO_4$ acid. $[H_3O^+] = 9.1 \times 10^{-2} M$.

$pH = -\log 9.1 \times 10^{-2} = 1.04$.

$pOH = 14 - 1.04 = \boxed{12.29}$

ⓓ pH of 0.07 M KOH (base!)

$pOH = -\log 0.07 = 1.15$

$pH = 14 - 1.15 = \boxed{12.85}$