

Name :

Date :

Acids, Bases, and pH Values

① Fill in the blanks.

i) The _____ measures how acidic or basic a solution is. The scale goes from ____ to ____

ii) If pH is less than 7, the substance is _____. If the pH is 7, the substance is _____. If pH is more than 7, the substance is _____. Most substances are _____

② Calculate the pH of a solution with $[H^+] = 5 \times 10^{-5} \text{ M}$

③ Calculate the pH of a solution with $[H^+] = 1 \text{ M}$

④ Calculate the pH of 0.01 M solution of HCl.

⑤ Calculate the pH of 0.05 M solution of NaOH.

⑥ What is the pH of a 0.0235 M HCl solution?

⑦ What is the pOH of a 0.0235 M HCl solution?

⑧ What is the pH of a $6.50 \times 10^{-3} \text{ M}$ KOH solution?

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Answers

- ① Fill in the blanks.
- i) The pH scale measures how acidic or basic a solution is. The scale goes from 0 to 14
- ii) If pH is less than 7, the substance is acidic . If the pH is 7, the substance is neutral . If pH is more than 7, the substance is basic . Most substances are neutral
- ② Calculate the pH of a solution with $[H^+] = 5 \times 10^{-5} \text{ M}$
 $pH = -\log[H^+] = -\log[5 \times 10^{-5}] = 4.3$
- ③ Calculate the pH of a solution with $[H^+] = 1 \text{ M}$
 $pH = -\log[H^+] = -\log[1] = 0$
- ④ Calculate the pH of 0.01 M solution of HCl.
 $pH = -\log[H^+] = -\log[0.01] = 2$
- ⑤ Calculate the pH of 0.05 M solution of NaOH.
 $pOH = -\log[OH^-] = -\log[0.05] = 1.3.$
 $pH = 14 - pOH = 14 - 1.3 = 12.7$
- ⑥ What is the pH of a 0.0235 M HCl solution?
 $pH = -\log[H^+] = -\log[0.0235] = 1.629$
- ⑦ What is the pOH of a 0.0235 M HCl solution?
 $pH = -\log[H^+] = -\log[0.0235] = 1.629$
 $pOH = 14.000 - pH = 14.000 - 1.629 = 12.371$
- ⑧ What is the pH of a $6.50 \times 10^{-3} \text{ M}$ KOH solution?
 $pOH = -\log[OH^-] = -\log[6.50 \times 10^{-3}] = 2.187$
 $pH = 14.000 - pOH = 14.000 - 2.187 = 11.813$