

Exercise 7.31 – The pH scale

Q731-01 The pH value of a $1.00 \times 10^{-3} \text{ mol dm}^{-3}$ solution of sodium hydroxide is which of the following?

- A. 3
 - B. 8
 - C. 11
 - D. 14
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Q731-02 Aqueous solutions of each of the following have a concentration of $0.100 \text{ mol dm}^{-3}$. Which has the highest pH?

- A. HCl
 - B. CH_3COOH
 - C. NaOH
 - D. NH_3
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Q731-03 Solutions P, Q, R and S have the following properties: P: pH = 8, Q: $[\text{H}^+] = 1 \times 10^{-3} \text{ mol dm}^{-3}$, R: pH = 5, S: $[\text{H}^+] = 1 \times 10^{-7} \text{ mol dm}^{-3}$.

When these solutions are arranged in order of increasing acidity (least acidic first) the correct order is:

- A. P, S, R, Q
 - B. Q, R, S, P
 - C. S, R, P, Q
 - D. R, P, Q, S
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Q731-04 How does the $[\text{H}^+]$ in an aqueous solution with pH = 4 compare with the $[\text{H}^+]$ in a solution with a pH = 2? The $[\text{H}^+]$ is:

- A. Twice as great
 - B. Half as much
 - C. 1/10 of the value
 - D. 1/100 of the value
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Q731-05 When the pH of a solution changes from 2.0 to 4.0, the hydrogen ion concentration:

- A. increases by a factor of 100.
 - B. increases by a factor of 2.
 - C. decreases by a factor of 2.
 - D. decreases by a factor of 100.
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Q731-06 The pH of a solution is 2. If its pH is increased to 6, how many times greater is the $[\text{H}^+]$ of the original solution?

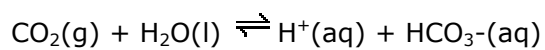
- A. 3
 - B. 4
 - C. 1000
 - D. 10000
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Q731-07 When the following 0.10 mol dm^{-3} solutions are arranged in order of increasing pH (lowest first) what is the correct order?

- A. $\text{NH}_3(\text{aq})$, $\text{NaOH}(\text{aq})$, $\text{HCl}(\text{aq})$, $\text{CH}_3\text{COOH}(\text{aq})$
 - B. $\text{NaOH}(\text{aq})$, $\text{NH}_3(\text{aq})$, $\text{CH}_3\text{COOH}(\text{aq})$, $\text{HCl}(\text{aq})$
 - C. $\text{HCl}(\text{aq})$, $\text{CH}_3\text{COOH}(\text{aq})$, $\text{NH}_3(\text{aq})$, $\text{NaOH}(\text{aq})$
 - D. $\text{HCl}(\text{aq})$, $\text{CH}_3\text{COOH}(\text{aq})$, $\text{NaOH}(\text{aq})$, $\text{NH}_3(\text{aq})$
 - E. $\text{NaOH}(\text{aq})$, $\text{NH}_3(\text{aq})$, $\text{HCl}(\text{aq})$, $\text{CH}_3\text{COOH}(\text{aq})$
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Q731-08 What will happen if $\text{CO}_2(\text{g})$ is allowed to escape from the following reaction mixture at equilibrium?



- A. The pH will decrease
 - B. The pH will increase
 - C. The pH will remain constant
 - D. The pH will become zero
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Q731-09 An acidic solution could have a pH of:

- A. 7
 - B. 10
 - C. 3
 - D. 14
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Q731-10 What is the pH of a 0.00001 molar HCl solution?

- A. 1
 - B. 9
 - C. 5
 - D. 4
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