



[WWW.CHEMSHEETS.CO.UK](http://www.chemsheets.co.uk)

pH of STRONG BASES

pH of STRONG BASES

$$\text{pH} = -\log [\text{H}^+]$$

always give pH to 2dp

0.200 mol dm⁻³ NaOH

$$[\text{H}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}^+] [\text{OH}^-]$$

$$[\text{H}^+] = \frac{K_w}{[\text{OH}^-]}$$

$$[\text{H}^+] = \frac{10^{-14}}{0.200} = 5.0 \times 10^{-14}$$

$$\text{pH} = -\log[\text{H}^+] = -\log 5.0 \times 10^{-14}$$

$$\text{pH} = \mathbf{13.30}$$

pH of STRONG BASES

$$\text{pH} = -\log [\text{H}^+]$$

always give pH to 2dp

$$[\text{H}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}^+] [\text{OH}^-]$$

0.0500 mol dm⁻³ Ba(OH)₂

$$[\text{OH}^-] = 2 \times 0.0500 = 0.100$$

$$[\text{H}^+] = \frac{K_w}{[\text{OH}^-]}$$

$$[\text{H}^+] = \frac{10^{-14}}{0.100} = 1.0 \times 10^{-13}$$

$$\text{pH} = -\log[\text{H}^+] = -\log 1.0 \times 10^{-13}$$

$$\text{pH} = \mathbf{13.00}$$

pH of STRONG BASES

$$\text{pH} = -\log [\text{H}^+]$$

always give pH to 2dp

$$[\text{H}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}^+] [\text{OH}^-]$$

[KOH] with pH 12.70?

$$[\text{H}^+] = 10^{-\text{pH}} = 10^{-12.70} = 2.00 \times 10^{-13}$$

$$[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{10^{-14}}{2.00 \times 10^{-13}} = 0.0501$$

$$[\text{KOH}] = 0.0501 \text{ mol dm}^{-3}$$

pH of STRONG BASES

$$\text{pH} = -\log [\text{H}^+]$$

always give pH to 2dp

$$[\text{H}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}^+] [\text{OH}^-]$$

[Ba(OH)₂] with pH 13.30?

$$[\text{H}^+] = 10^{-\text{pH}} = 10^{-13.30} = 5.01 \times 10^{-14}$$

$$[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{10^{-14}}{5.01 \times 10^{-14}} = 0.200$$

$$[\text{Ba(OH)}_2] = 0.200 \times \frac{1}{2} = \mathbf{0.100 \text{ mol dm}^{-3}}$$

pH of STRONG BASES on DILUTION

$$\text{pH} = -\log [\text{H}^+]$$

$$[\text{H}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}^+] [\text{OH}^-]$$

always give pH to 2dp

Calculate the pH of the solution formed when 50 cm³ of water is added to 100 cm³ of 0.200 mol dm⁻³ NaOH

$$\text{original } [\text{OH}^-] = 0.200$$

$$\text{diluted } [\text{OH}^-] = 0.200 \times \frac{100}{150} = 0.1333$$

$$\text{diluted } [\text{H}^+] = \frac{K_w}{[\text{OH}^-]} = \frac{10^{-14}}{0.133} = 7.50 \times 10^{-14}$$

$$\text{pH} = -\log [\text{H}^+] = -\log 7.50 \times 10^{-14} = \mathbf{13.12}$$

pH of STRONG BASES on DILUTION

$$\text{pH} = -\log [\text{H}^+]$$

$$[\text{H}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}^+] [\text{OH}^-]$$

always give pH to 2dp

Calculate the pH of the solution formed when 50 cm³ of 0.250 mol dm⁻³ KOH is made up to 250 cm³ of solution with water

$$\text{original } [\text{OH}^-] = 0.250$$

$$\text{diluted } [\text{OH}^-] = 0.250 \times \frac{50}{250} = 0.0500$$

$$\text{diluted } [\text{H}^+] = \frac{K_w}{[\text{OH}^-]} = \frac{10^{-14}}{0.0500} = 2.00 \times 10^{-13}$$

$$\text{pH} = -\log [\text{H}^+] = -\log 2.00 \times 10^{-13} = \mathbf{12.70}$$