CALCULATIONS RELATED TO PH

pHA type exercises

- 1. Calculate the pH of the solution, where the concentration of HCl is 0.0926 mol/dm³. $K_w = 1.00 \times 10^{-14}$ Answer: 1.03
- 2. Calculate the pH of the solution, where the concentration of H₂SO₄ is 0.0433 mol/dm³. $K_w = 1.00 \times 10^{-14}$ Answer: 1.06
- 3. Calculate the pH of the solution, where the concentration of NaOH is 0.0813 mol/dm³. $K_w = 1.00 \times 10^{-14}$ Answer: 12.91
- 4. Calculate the pH of the solution, where the concentration of Ba(OH)₂ is 0.0346 mol/dm³. $K_w = 1.00 \times 10^{-14}$ Answer: 12.84
- 5. Calculate the concentration of HNO₃ in a nitric acid solution with pH= 2.15. $K_w = 1.00 \times 10^{-14}$ Answer: 7.08×10^{-3} mol/dm³
- 6. Calculate the concentration of H₂SO₄ in a sulfuric acid solution with pH = 1.51. $K_w = 1.00 \times 10^{-14}$ Answer: 1.55×10^{-2} mol/dm³
- 7. Calculate the concentration of NaOH in a sodium hydroxide solution with pH = 13.55. $K_w = 1.00 \times 10^{-14}$ Answer: 0.355 mol/dm³
- 8. Calculate the concentration of Ca(OH)₂ in a calcium hydroxide solution with pH = 13.87. $K_w = 1.00 \times 10^{-14}$ Answer: 0.371 mol/dm³

pHB type exercises

- 1. Calculate the pH of the aqueous solution, in which two of the following solutions were mixed and the volume was adjusted to 500 cm³ with water: 45.5 cm³, 0.574 mol/dm³ of hydrochloric acid (HCl) and 59.3 cm³, 0.450 mol/dm³ of potassium hydroxide (KOH). $K_w = 1.00 \times 10^{-14}$ Answer: 11.06
- 2. Calculate the pH of the aqueous solution, in which two of the following solutions were mixed and the volume was adjusted to 1000 cm³ with water: 45.5 cm³, 0.502 mol/dm³ of hydrochloric acid (HCl) and 69.1 cm³, 0.461 mol/dm³ of calcium hydroxide (Ca(OH)₂)? $K_w = 1.00 \times 10^{-14}$ Answer: 12.31
- 3. Calculate the pH of the aqueous solution, in which two of the following solutions were mixed and the volume was adjusted to 250 cm³ with water: 45.5 cm³, 0.324 mol/dm³ of hydrochloric acid (HCl) and 20.3 cm³, 0.450 mol/dm³ of potassium hydroxide (KOH). $K_w = 1.00 \times 10^{-14}$ Answer: 1.65
- 4. Calculate the pH of the aqueous solution, in which two of the following solutions were mixed and the volume was adjusted to 100 cm³ with water: 15.1 cm³, 0.427 mol/dm³ of hydrochloric acid (HCl) and 8.12 cm³, 0.329 mol/dm³ of calcium hydroxide (Ca(OH)₂)? $K_w = 1.00 \times 10^{-14}$ Answer: 1.96

pHC type exercises

- 1. Calculate the pH of the acetic acid solution, where the initial concentration of CH₃COOH is 1.40×10^{-3} mol/dm³. $K_a = 1.75 \times 10^{-5}$ and $K_w = 1.00 \times 10^{-14}$ Answer: 3.83
- 2. Calculate the pH of the ammonia solution, where the initial concentration of NH₃ is 1.41×10^{-3} mol/dm³. $K_b = 1.79 \times 10^{-5}$ and $K_w = 1.00 \times 10^{-14}$ Answer: 10.18
- 3. Calculate the initial concentration of acetic acid in the solution of pH = 3.42. $K_a = 1.75 \times 10^{-5}$ and $K_w = 1.00 \times 10^{-14}$ Answer: 8.63×10^{-3} mol/dm³
- 4. Calculate the initial concentration of ammonia in the solution of pH = 10.32. $K_b = 1.79 \times 10^{-5}$ and $K_w = 1.00 \times 10^{-14}$ Answer: 2.65×10^{-3} mol/dm³