7. Exercise General Chemistry 09.12.2022

WS 2022/23

7.1

To each 1 L of the following solutions, add 1 mL of hydrochloric acid with a concentration of 1 mol/L. Calculate the pH value before and after the addition.

a) 10^{-4} mol/L hydrochloric acid; b) 10^{-4} mol/L Sodium hydroxide solution;

c) Mixture of 10^{-2} mol/L Acetic acid, 10^{-2} mol/L Sodium acetat (pK_S Acetic acid: 4,75)

7.2

0.02 mol of a weak monovalent base are dissolved in 3 dm^3 of water. The degree of dissociation is determined to be 1 ‰. Calculate the pH and the pK_B value.

7.3

5 ml 0,002 M Acetic Acid and 6 ml 0,001 M NaOH are mixed. What is the pH value of the solutions before the combination and the solution after the combination? $K_A(HAc) = 1 \cdot 10^{-5}$ mol/dm^3

7.4

Complete and balance the following reaction equations:

$Zn + MoO_3 \rightarrow Zn^{2+} + Mo^{3+}$

$PbS + H_2O_2 \rightarrow PbSO_4$

$OH^- + Cl_2 \rightarrow ClO_3^- + Cl^-$ (alkaline)

$MnO_4^- + CN^- \rightarrow MnO_2 + CNO^-$ (alkaline)

$S \rightarrow SO_3^{2-} + S^{2-}$ (alkaline)

$S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-}$

$H_2S + Br_2 \rightarrow S$

$I_2 + Cl_2 \rightarrow H_3IO_6^{2-}$

$MnO_2 + HCl \rightarrow Cl_2 + Mn^{2+}$

$NO + NO_3^- \rightarrow N_2O_4$