7. Exercise General Chemistry   04.01.2024

WS 2023/24

7.1

Calculate the mass of $2 \cdot 10^{-4}$ mol naphthalene.

7.2

A sample of a compound consisting only of C and H is burned with oxygen and yields 13.20 g CO2 and 6.306 g H2O. The molar mass of the compound is 86.17 g/mol. Give the molecular formula and a possible structural formula of the compound.

7.3

Write down the reaction equation for the combustion of benzoic acid with oxygen.

7.4

100 cm^3 0.1 M $BaCl_2$ solution is mixed with 300 cm^3 0.05 M Na_2SO_4 solution.
Calculate the mass of the precipitate and the concentrations in the solution. Assume that the solubility product of $BaSO_4$ is zero.

7.5

Oxalic acid reacts with $KMnO_4$ to form carbon dioxide and Mn^{2+}. 0.1265 g of oxalic acid ($H_2C_2O_4 \bullet 2\,H_2O$) consume 40.6 ml of a $KMnO_4$ solution during the titration. What is the concentration of the $KMnO_4$ solution?

7.6

The half-life time of a 0th order gas reaction is 1 s at a pressure of 0.1 bar. Calculate the reaction rate constant.

7.7

A tritium gas light source contains radioactive tritium (^3_1H, half-life $t_½$ = 12.3 years) with an activity of 1GBq. Which mass of tritium is contained in the light source?