**Problem 1.1** Calculate molecular mass of glucose (C6H12O6) molecule.

**Problem 1.2** A compound contains 4.07 % hydrogen, 24.27 % carbon and 71.65 % chlorine. Its molar mass is 98.96 g. What are its empirical and molecular formulas ?

**Problem 1.3** Calculate the amount of water (g) produced by the combustion of 16 g of methane.

**Problem 1.4** How many moles of methane are required to produce 22 g CO2 (g) after combustion?

**Problem 1.5** 50.0 kg of N2 (g) and 10.0 kg of H2 (g) are mixed to produce NH3 (g). Calculate the

NH3 (g) formed. Identify the limiting reagent in the production of NH3 in this situation.

**Problem 1.6** A solution is prepared by adding 2 g of a substance A to 18 g of water. Calculate the mass per cent of the solute.

**Problem 1.7** Calculate the molarity of NaOH in the solution prepared by dissolving its 4 g in enough water to form 250 mL of the solution.

**Problem 1.8** The density of 3 M solution of NaCl is 1.25 g mL–1. Calculate molality of the solution.