Worksheet 1.7

Moles in solution

1 **a** Calculate the concentration of each of the following solutions.
   i 0.840 mol of solute dissolved in 5.00 dm^3 of solution
   ii 0.360 mol of solute dissolved in 300 cm^3 of solution
   iii 0.0200 mol of solute dissolved in 25.0 cm^3 of solution
   iv 24.0 mol of solute dissolved in 30.0 dm^3 of solution
   b **i** Which of the solutions above is the most concentrated?
   ii Which of the solutions above is the most dilute (least concentrated)?
   iii Which of the solutions above have the same concentration? [7]

2 Calculate the concentration of each of the following solutions.
   a 0.760 g of potassium nitrate(V) (KNO_3) dissolved to make 80.0 cm^3 of solution
   b 12.0 g of $CuSO_4.5H_2O$ dissolved to make 100 cm^3 of solution
   c 54.0 g of glucose ($C_6H_{12}O_6$) dissolved to make 300 cm^3 of solution
   d 120 g of nitric(V) acid (HNO_3) dissolved to make 200 cm^3 of solution [12]

3 How many moles of solute does each of the following samples contain?
   a 60.0 cm^3 of a 2.00 mol dm^{-3} solution
   b 200 cm^3 of a 0.200 mol dm^{-3} solution
   c 0.500 dm^3 of a 1.00 mol dm^{-3} solution
   d 12.6 cm^3 of a 0.250 mol dm^{-3} solution [4]

4 What volume of a solution of concentration 0.0800 mol dm^{-3} should be measured out
   to give each of the following amounts? Give your answers both in dm^3 and in cm^3.
   a 0.000100 mol
   b 0.000320 mol
   c 0.0400 mol [6]