Review Exercise 2 - Answers

1. Perform the following conversions using dimensional analysis:

a) 250 g to kg

$250\ \cancel{g} \times \frac{1\ kg}{1000\ \cancel{g}} = 0.250\ kg$

b) 0.800 L to mL

$0.800\ \cancel{L} \times \frac{1 \times 10^3\ mL}{1\ \cancel{L}} = 8.00 \times 10^2\ mL$

c) 500 mL to L

$500\ \cancel{mL} \times \frac{1\ L}{1000\ \cancel{mL}} = 0.500\ L$

d) 720 mmol to mol

$720\ \cancel{mmol} \times \frac{1\ mol}{1000\ \cancel{mmol}} = 0.720\ mol$

e) 0.060 kg to g

$0.060\ \cancel{kg} \times \frac{1000\ g}{1\ \cancel{kg}} = 60\ g$

f) 900 cm^2 to m^2

$900\ \cancel{cm^2} \times \frac{1\ m^2}{10\ 000\ \cancel{cm^2}} = 0.0900\ m^2$

g) 20.0 g of NaOH to moles of NaOH

$20.0\ \cancel{g\ NaOH} \times \frac{1\ mol\ NaOH}{40.00\ \cancel{g\ NaOH}} = 0.500\ mol\ NaOH$

h) 2.5 mole of sulfuric acid to grams

$2.5\ \cancel{mol\ H_2SO_4} \times \frac{98.08\ g\ H_2SO_4}{1\ \cancel{mol\ H_2SO_4}} = 2.5 \times 10^2\ g\ H_2SO_4$

i) 3.0 g of ice to moles of ice

$3.0\ g\ \cancel{H_2O_{(s)}} \times \frac{1\ mol\ H_2O_{(s)}}{18.02\ g\ \cancel{H_2O_{(s)}}} = 0.17\ mol\ H_2O_{(s)}$

j) Given $P_{4(s)} + 5O_{2(g)} \text{ -----> } 2P_2O_{5(s)}$

How many moles of phosphorus will react with 11.6 mol of oxygen gas?

$11.6\ \cancel{mol\ O_{2(g)}} \times \frac{1\ mol\ P_{4(s)}}{5\ \cancel{mol\ O_{2(g)}}} = 2.32\ mol\ P_{4(s)}$

How many moles of $O_{2(g)}$ will produce 6.12 mol of $P_2O_{5(s)}$?

$6.12\ \cancel{mol\ P_2O_{5(s)}} \times \frac{5\ mol\ O_{2(g)}}{2\ \cancel{mol\ P_2O_{5(s)}}} = 15.3\ mol\ O_{2(g)}$