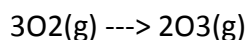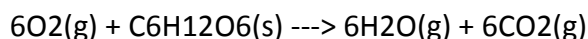# Answer on the question #50445, Chemistry, Inorganic Chemistry

Question:

1. If an electric discharge produces 800 cm3 of ozone (O3), how many cm3 of oxygen (O2) are required?

3O2(g) ---> 2O3(g)

2. When 75.0 dm3 of O2 react with an excess of glucose (C6H12O2), according to the reaction below, what volume of carbon dioxide will be produced?

6O2(g) + C6H12O6(s) ---> 6H2O(g) + 6CO2(g)

Solution:

1) According to the chemical reaction equation 3O2(g) ---> 2O3(g):

$$\frac{n(O_2)}{3} = \frac{n(O_3)}{2} \Rightarrow n(O_2) = \frac{3n(O_3)}{2}$$

From molar volume definition:

$$V(O_2) = V_m \cdot n(O_2)$$

$$V(O_3) = V_m \cdot n(O_3) \Rightarrow n(O_3) = \frac{V(O_3)}{V_m}$$

$$V(O_2) = V_m \cdot \frac{3n(O_3)}{2} = V_m \cdot \frac{3V(O_3)}{2V_m} = \frac{3V(O_3)}{2} = \frac{3 \cdot 800}{2} = 1200 \text{ cm}^3$$

2) According to the chemical reaction equation 6O2(g) + C6H12O6(s) ---> 6H2O(g) + 6CO2(g):

$$\frac{n(O_2)}{6} = \frac{n(CO_2)}{6} \Rightarrow n(O_2) = n(CO_2)$$

As the volume is proportional to the number of the moles with the molar volume coefficient,

$$V(O_2) = V(CO_2) = 75.0 \text{ dm}^3$$

Answer: 1)1200 cm^3 , 2) 75.0 dm^3