Mole Calculations #2

1) What is the mass of 0.750 moles of $ZnSO_4$?

2) How many molecules are there in 0.435 moles of $C_6H_{12}O_6$?

3) How many moles are there in 7.62×10^{25} molecules of oxygen?

4) How many grams do 3.294×10^{21} molecules of $FeSO_4$ mass?

5) How many molecules are there in 63.92 grams of CCl_4?

Solutions

1) What is the mass of 0.750 moles of $ZnSO_4$?

$0.750 \text{ mole } ZnSO_4 \times \frac{161.5 \text{ g } ZnSO_4}{1 \text{ mole } ZnSO_4} = 121 \text{ g } ZnSO_4$

2) How many molecules are there in 0.435 moles of $C_6H_{12}O_6$?

$0.435 \text{ mole } C_6H_{12}O_6 \times \frac{6.022 \times 10^{23} \text{ molecules } C_6H_{12}O_6}{1 \text{ mole } C_6H_{12}O_6} = 2.62 \times 10^{23} \text{ molecules } C_6H_{12}O_6$

3) How many moles are there in 7.62×10^{25} molecules of oxygen?

$7.62 \times 10^{25} \text{ molecules } O_2 \times \frac{1 \text{ mole } O_2}{6.022 \times 10^{23} \text{ molecules } O_2} = 127 \text{ moles } O_2$

4) How many grams do 3.294×10^{21} molecules of $FeSO_4$ mass?

$3.294 \times 10^{21} \text{ molecules } FeSO_4 \times \frac{1 \text{ mole } FeSO_4}{6.022 \times 10^{23} \text{ molecules } FeSO_4} \times \frac{151.9 \text{ g } FeSO_4}{1 \text{ mole } FeSO_4}$

$= 0.8309 \text{ g } FeSO_4$

5) How many molecules are there in 63.92 grams of CCl_4?

$63.92 \text{ grams } CCl_4 \times \frac{1 \text{ mole } CCl_4}{153.8 \text{ g } CCl_4} \times \frac{6.022 \times 10^{23} \text{ molecules } CCl_4}{1 \text{ mole } CCl_4}$

$= 2.503 \times 10^{23} \text{ molecules } CCl_4$