Key

Moles, Molecules, and Grams Worksheet

1) How many molecules are there in 24 grams of FeF_3?

$$24\text{g } FeF_3 \left| \frac{1\text{ mol } FeF_3}{113\text{g } FeF_3} \right| \frac{6.02\times10^{23}\text{ molec. } FeF_3}{1\text{ mol } FeF_3} = 1.3\times10^{23}\text{ molec. } FeF_3$$

2) How many molecules are there in 450 grams of Na_2SO_4?

$$450\text{g } Na_2SO_4 \left| \frac{1\text{ mol } Na_2SO_4}{142\text{g } Na_2SO_4} \right| \frac{6.02\times10^{23}\text{ molec } Na_2SO_4}{1\text{ mol } Na_2SO_4} = 1.9\times10^{24}\text{ molec. } Na_2SO_4$$

3) How many grams are there in 2.3×10^{24} atoms of silver?

$$2.3\times10^{24}\text{ atoms Ag} \left| \frac{1\text{ mol Ag}}{6.02\times10^{23}\text{ atoms Ag}} \right| \frac{108\text{g Ag}}{1\text{ mol Ag}} = 410\text{g Ag}$$

4) How many grams are there in 7.4×10^{23} molecules of $AgNO_3$?

$$7.4\times10^{23}\text{ molec } AgNO_3 \left| \frac{1\text{ mol } AgNO_3}{6.02\times10^{23}\text{ molec } AgNO_3} \right| \frac{170\text{g } AgNO_3}{1\text{ mol } AgNO_3} = 210\text{g } AgNO_3$$

5) How many grams are there in 7.5×10^{23} molecules of H_2SO_4?

$$7.5\times10^{23}\text{ molec } H_2SO_4 \left| \frac{1\text{ mol } H_2SO_4}{6.02\times10^{23}\text{ molec } H_2SO_4} \right| \frac{98\text{g } H_2SO_4}{1\text{ mol } H_2SO_4} = 120\text{g } H_2SO_4$$

6) How many molecules are there in 122 grams of $Cu(NO_3)_2$?

$$122\text{g } Cu(NO_3)_2 \left| \frac{1\text{ mol } Cu(NO_3)_2}{187.5\text{g } Cu(NO_3)_2} \right| \frac{6.02\times10^{23}\text{ molec. } Cu(NO_3)_2}{1\text{ mol } Cu(NO_3)_2} = 3.92\times10^{23}\text{ molec. } Cu(NO_3)_2$$

7) How many grams are there in 9.4×10^{25} molecules of H_2?

$$9.4\times10^{25}\text{ molec. } H_2 \left| \frac{1\text{ mol } H_2}{6.02\times10^{23}\text{ molec } H_2} \right| \frac{2\text{g } H_2}{1\text{ mol } H_2} = 310\text{g } H_2$$

8) How many molecules are there in 230 grams of $CoCl_2$?

$$230\text{g } CoCl_2 \left| \frac{1\text{ mol } CoCl_2}{130\text{g } CoCl_2} \right| \frac{6.02\times10^{23}\text{ molec. } CoCl_2}{1\text{ mol } CoCl_2} = 1.4\times10^{24}\text{ molec. } CoCl_2$$

9) How many molecules are there in 2.3 grams of NH_4SO_2?

$$\frac{2.3\text{g } NH_4SO_2 \mid 6.02\times10^{23}}{82} = 1.7\times10^{22}\text{ molec. } NH_4SO_2$$

10) How many grams are there in 3.3×10^{23} molecules of N_2I_6?

762
28

$$\frac{3.3\times10^{23} \mid 790\text{g } N_2I_6}{6.02\times10^{23}} = 430\text{g } N_2I_6$$

11) How many molecules are there in 200 grams of CCl_4?

$$\frac{200\text{g} \mid 6.02\times10^{23}}{154\text{g}} = 8\times10^{23}\text{ molec. } CCl_4$$

12) How many grams are there in 1×10^{24} molecules of BCl_3?

10 | 9.5

$$\frac{1\times10^{24} \mid 117.5\text{g}}{6.02\times10^{23}} = 200\text{g } BCl_3$$

13) How many grams are there in 4.5×10^{22} molecules of $Ba(NO_2)_2$?

137
28
64

$$\frac{4.5\times10^{22}\text{ molec} \mid 229}{6.02\times10^{23}} = 17\text{g } Ba(NO_2)_2$$

14) How many molecules are there in 9.34 grams of LiCl?

$$\frac{9.34\text{g} \mid 6.02\times10^{23}}{42.5} = 1.32\times10^{23}\text{ molec LiCl}$$

15) How many grams do 4.3×10^{21} molecules of UF_6 weigh?

238
114

$$\frac{4.3\times10^{21} \mid 352\text{g}}{6.02\times10^{23}} = 2.5\text{g } UF_6$$

16) How many molecules are there in 230 grams of NH_4OH?

$$\frac{230\text{g} \mid 6.02\times10^{23}}{35\text{g}} = 4.0\times10^{24}\text{ molec } NH_4OH$$