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Chemistry\_Questions\_0085

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1.

A sample of chromium (III) oxide,  $\text{Cr}_2\text{O}_3$ , contains 0.599 g of chromium. What mass of oxygen is present?

1. 0.276 g O

2. 0.184 g O

3. 0.599 g O

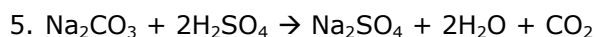
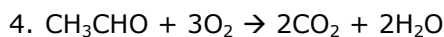
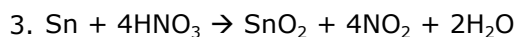
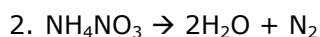
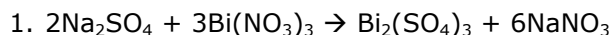
4. 1.30 g O

5. 0.123 g O

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2.

Which one of the following equations is properly balanced?



3.

A sample of TNT,  $\text{C}_7\text{H}_5\text{N}_3\text{O}_6$ , has  $7.36 \times 10^{21}$  nitrogen atoms. How many hydrogen atoms are there in this sample of TNT?

1.  $1.23 \times 10^{22}$

2.  $7.36 \times 10^{21}$

3.  $9.81 \times 10^{21}$

4.  $1.47 \times 10^{22}$

5.  $1.72 \times 10^{22}$

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4.

Which one of the following contains  $1.20 \times 10^{24}$  atoms?

1. 4.00 g He

2. 13.0 g  $\text{C}_2\text{H}_2$

3. 42.0 g N <sub>2</sub>
4. 8.0 g CH <sub>4</sub>
5. 24.0 g O <sub>2</sub>

5.

How many moles of hydrogen chloride are present in a sample consisting of  $5.42 \times 10^{23}$  molecules of HCl?

1. 1.00 mole
2. $1.98 \times 10^{25}$ moles
3. $1.49 \times 10^{22}$ moles
4. $3.26 \times 10^{47}$ moles
5. $9.00 \times 10^{-1}$ moles

6.

How many moles of pentane, C<sub>5</sub>H<sub>12</sub>, are in a 33-g sample?

1. 0.46 mol
2. 0.79 mol
3. 0.55 mol
4. 4.1 mol
5. 3.3 mol

7.

How many atoms are present in 583 g of KPF<sub>6</sub> (MW = 184.1 g/mol)?

1. $2.81 \times 10^{25}$
2. $3.17 \times 10^{21}$
3. $1.53 \times 10^{26}$
4. $1.43 \times 10^{25}$
5. $1.91 \times 10^{21}$

8.

How many moles of carbon are present in 5.19 mL of liquid ethanol (C<sub>2</sub>H<sub>5</sub>OH,  $d = 0.789$  g/mL)?

1. 0.00660 moles C
2. 0.0444 moles C
3. 0.0714 moles C
4. 0.286 moles C

5. 0.178 moles C
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9.

For the reaction  $2\text{Mg}(s) + \text{O}_2(g) \rightarrow 2\text{MgO}(s)$ , how many moles of  $\text{O}_2$  are required to react completely with 0.0232 moles of Mg?

1. 0.0155 moles $\text{O}_2$
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2. 0.0116 moles $\text{O}_2$
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3. 0.0348 moles $\text{O}_2$
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4. 0.0232 moles $\text{O}_2$
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5. 0.0464 moles $\text{O}_2$
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10.

The amount of calcium in a 15.0-g sample was determined by converting the calcium to calcium oxalate,  $\text{CaC}_2\text{O}_4$ . The  $\text{CaC}_2\text{O}_4$  weighed 12.4 g. What is the percent of calcium in the original sample?

1. 14.5%
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2. 33.1%
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3. 25.8%
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4. 10.6%
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5. 82.7%
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11.

What volume of liquid toluene ( $\text{C}_6\text{H}_5\text{CH}_3$ ,  $d = 0.867 \text{ g/mL}$ ) contains  $4.15 \times 10^{24}$  molecules?

1. 0.551 L
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2. 0.0648 L
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3. 1.37 L
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4. 0.732 L
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5. 11.6 L
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12.

A sample of liquid thionyl chloride ( $\text{SOCl}_2$ ,  $d = 1.655 \text{ g/mL}$ ) contains 6.31 moles of the compound. What volume of thionyl chloride is present?

1. $8.78 \times 10^{-2} \text{ mL}$
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2. $7.51 \times 10^2 \text{ mL}$
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3. $3.81 \times 10^0 \text{ mL}$
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4. $4.54 \times 10^2 \text{ mL}$
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5. $1.24 \times 10^3 \text{ mL}$
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13.

An organic compound has a molecular mass of 294.2 and contains 81.58% carbon by mass. How many carbon atoms are in each molecule of this compound?

1. 22
2. 15
3. 27
4. 25
5. 20

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14.

If 43.4 g of O<sub>2</sub> are mixed with 43.4 g of H<sub>2</sub> and the mixture is ignited, what mass of water is produced?

1. 48.8 g
2. 77.2 g
3. 391 g
4. 87 g
5. 43.4 g

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15.

A 1.1 g sample of washing soda, Na<sub>2</sub>CO<sub>3</sub> · 10H<sub>2</sub>O, has 2.3 × 10<sup>21</sup> carbon atoms. How many oxygen atoms are present in 1.1 g of washing soda?

1. 6.9 × 10 <sup>21</sup>
2. 2.5 × 10 <sup>21</sup>
3. 2.3 × 10 <sup>22</sup>
4. 2.3 × 10 <sup>21</sup>
5. 3.0 × 10 <sup>22</sup>

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16.

The formula weight of aluminum oxalate, Al<sub>2</sub>(C<sub>2</sub>O<sub>4</sub>)<sub>3</sub>, is

1. 318 g/mol.
2. 272 g/mol.
3. 212 g/mol.
4. 178 g/mol.
5. 152 g/mol.

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17.

A sample of acetic acid, CH<sub>3</sub>COOH, contains 2.22 × 10<sup>20</sup> oxygen atoms. How many moles

of hydrogen are present?

1. $1.84 \times 10^{-4}$ moles H
2. $1.11 \times 10^{-3}$ moles H
3. $5.53 \times 10^{-4}$ moles H
4. $7.37 \times 10^{-4}$ moles H
5. $1.47 \times 10^{-3}$ moles H

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**18.**

What is the weight in grams of *one* molecule of the compound  $C_7H_6O_4$ ?

1. $1.33 \times 10^{-22}$ g
2. 154 g
3. $2.56 \times 10^{-22}$ g
4. $2.82 \times 10^{-22}$ g
5. $3.91 \times 10^{21}$ g

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**19.**

The hormone testosterone has a molecular mass of 288.4 and contains 79.12% carbon by mass. How many carbon atoms are in each testosterone molecule?

1. 17
2. 23
3. 21
4. 19
5. 28

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**20.**

What is the molar mass of the solid,  $C_6H_{10}N_4O_4$ ?

1. 192 g/mol
2. 106 g/mol
3. 146 g/mol
4. 202 g/mol
5. 138 g/mol