Conversion Assignment

Please use full conversion factor format that includes all unit extensions. There is one mark per conversion factor for a total of 35 marks. Please put a space between each answer. Answers are on the next page!

1. Find the mass of 1.60 mol of aluminium.

2. Find the mass of 0.250 mol of sulphur.

3. Find the amount of iron in a 3.30 g iron nail.

4. Find the amount of silver in a 23.6 g of pure silver.

5. Find the amount of copper in 7.65 g copper bracelet.

Questions 6, 7 and 8 do not require you to convert to molecules first. You can convert directly to atoms. Each of these questions can be accomplished with only two conversion factors

6. How many carbon atoms are in a 3.30 g diamond (pure carbon).

7. How many atoms are in a neon sign containing 6.80 g of neon.

8. How many atoms of mercury are in mercury thermometer containing 78.2 g of mercury.

9. Find the mass of 0.900 mol of ammonia ($NH_3(g)$).

10. Find the mass of 3.60 moll of freon-12 ($CCl_2F_2(g)$).

11. Find the amount of magnesium hydroxide in 204 g of this substance ($Mg(OH)_2$).

Please note that questions #12, 14, 16 and 18 require and additional conversion factor to convert the given mass unit to g. It is necessary to do this before using a mass(g) to amount(mol) conversion factor.

12. Find the amount sugar of a 1.00 kg bag of table sugar ($C_{12}H_{22}O_{11}(s)$).

13. Find the number of water molecules in a 250 g bottle of water.

14. Find the number of molecules cobalt(III)dichromate ($Co_2(Cr_2O_7)_3(s)$) in a 3.30 kg sample.

Questions 15, 16, 17 and 18 may be longer than you think! Each question starts with a molecule (i.e. fluorine gas is $F_2(g)$ and therefore a molecule). What this means is at some point you will nee to convert molecules to atoms for the element asked for. Because only one type of atom is asked for, the unit atoms will have an extension. For example, in the question 15 the final unit (and the unit present in the numerator of the last conversion factor) will be "atoms F"

15. How many atoms of fluorine are in 4.40 g of fluorine gas?

16. How many atoms of nitrogen are in 1.26 kg of nitrogen gas?

17. How many atoms of hydrogen are in 29.5 g of ethene ($C_2H_4(g)$)?

18. How many atoms of oxygen are in 0.170 mg of strontium hydroxide ($Sr(OH)_2(s)$)?

Answers:

1. 43.2 g Al
2. 8.02 g S
3. 0.0591 mol Fe
4. 0.221 mol Ag
5. 0.120 mol Cu
6. 1.65×10^{23} atoms C
7. 2.03×10^{23} atoms Ne
8. 2.35×10^{23} atoms Hg
9. 15.3 g NH_3
10. 435 g CCl_2F_2
11. 3.50 mol $Mg(OH)_2$
12. 2.92 mol $C_{12}H_{22}O_{11}$
13. 8.35×10^{24} molec H_2O
14. 2.59×10^{24} molec $Co_2(Cr_2O_7)_3$
15. 1.39×10^{23} atoms F
16. 5.42×10^{25} atoms N
17. 2.53×10^{24} atoms H
18. 1.68×10^{18} atoms O