

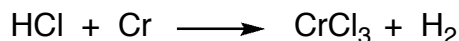
Formulas and Stoichiometry Problem Set

1. What is the simplest chemical formula for the following compound, which has this percent composition by weight?

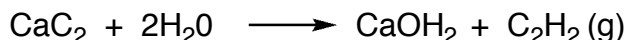
carbon	39%
hydrogen	16%
nitrogen	45%

- a. C_2H_7N
b. CH_5N
c. $C_2H_6N_2$
d. C_3H_9N
2. Now that we have obtained the empirical formula for the compound above, which of the following could serve as valuable steps toward obtaining its molecular formula?
- a. vaporizing a specific mass of the compound and measuring the volume of the gaseous product at a specific temperature and pressure.
b. titrating the compound with a strong acid.
c. performing nuclear magnetic resonance spectroscopy.
d. more than of the above could be useful.
3. A scientist carries out the complete combustion in the air of 44 grams of the compound $C_aH_bO_c$. 36 grams of water vapor and 88 grams of carbon dioxide are produced. What is the molecular formula of the compound?
- a. $C_4H_8O_1$
b. $C_2H_4O_1$
c. $C_2H_5O_1$
d. $C_4H_4O_1$

4. Which is the sum of the coefficients in the following equation when balanced?



- a. 6
b. 14
c. 13
d. 9
5. Acetylene is produced produced in a reaction between calcium carbide and water.



How many grams of C_2H_2 (acetylene) would be formed if 18 ml of water is consumed?

- a. 26 g
b. 28 g
c. 18 g
d. 13 g