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DETERMINING MOLECULAR FORMULAS (TRUE FORMULAS)

Name _____

olve the problems below.

1. The empirical formula of a compound is NO_2 . Its molecular mass is 92 g/mol. What is its molecular formula?

2. The empirical formula of a compound is CH_2 . Its molecular mass is 70 g/mol. What is its molecular formula?

3. A compound is found to be 40.0% carbon, 6.7% hydrogen and 53.5% oxygen. Its molecular mass is 60. g/mol. What is its molecular formula?

4. A compound is 64.9% carbon, 13.5% hydrogen and 21.6% oxygen. Its molecular mass is 74 g/mol. What is its molecular formula?

5. A compound is 54.5% carbon, 9.1% hydrogen and 36.4% oxygen. Its molecular mass is 88 g/mol. What is its molecular formula?

Section 17

Empirical and Molecular Formulae

EXERCISES

- ~~A-1. Find the empirical formula for the following compounds.~~
- a) 77.7% Fe, 22.3% O
 - b) 70.0% Fe, 30.0% O
 - c) 72.4% Fe, 27.6% O
 - d) 91.2% P, 8.82% H
 - e) 46.3% Li, 53.7% O
 - f) 26.6% K, 35.4% Cr, 38.0% O
 - g) 21.8% Mg, 27.9% P, 50.3% O
 - h) 3.66% H, 37.8% P, 58.4% O
 - i) 46.2% C, 7.69% H, 46.2% O
 - j) 50.5% C, 5.26% H, 44.2% N
- ~~A-2. A 7.30 g sample of a hydrocarbon is burned to give 23.8 g of CO_2 and 7.30 g of H_2O . What is the empirical formula of the compound?~~
- ~~A-3. A 5.00 g sample of a hydrocarbon is burned to give 16.9 g of CO_2 and 3.46 g of H_2O . What is the empirical formula of the compound?~~
- ~~B-4. A compound is known to contain C, H and S. A 7.00 g sample contains 3.73 g of S and can be burned to give 19.27 g of CO_2 and 4.20 g of H_2O . What is the empirical formula of the compound?~~
- ~~B-5. A compound is known to contain C, H and N. A 1.000 g sample contains 0.609 g of N and can be burned to give 1.276 g of CO_2 and 0.392 g of H_2O . What is the empirical formula of the compound?~~
- ~~B-6. A compound contains only C, H and O. A 6.50 g sample is burned to give 13.0 g of CO_2 and 5.32 g of H_2O . What is the empirical formula of the compound?~~
- ~~B-7. A compound contains C, H, N and O. A 16.800 g sample contains 5.680 g of C, 0.237 g of H and 3.31 g of N. What is the empirical formula of the compound?~~
- ~~B-8. A poisonous gas contains only Sn and H. When a 3.600 g sample of the gas was burned, 1.056 g of H_2O was formed. What is the empirical formula of the gas?~~
- ~~B-9. A compound contains C, H and O. A 5.90 g sample is burned to yield 11.18 g of CO_2 and 3.66 g of H_2O . What is the empirical formula of the compound?~~
- ~~B-10. When 15.0 g of a compound known to contain C, H, O and S were burned, 16.2 g of CO_2 , 6.63 g of H_2O and 15.7 g of SO_2 were collected. What was the empirical formula of the compound?~~
- ~~B-11. A compound was known to contain C, H, N and O. When a 51.3 mg sample was burned the products were 84.2 mg of CO_2 , 20.7 mg of H_2O and 10.7 mg of N_2 . What was the empirical formula of the compound?~~
- ~~B-12. A compound was known to contain C, H, N, O and S. When a 5.43 mg sample was burned the products were 8.43 mg of CO_2 , 1.15 mg of H_2O , 0.45 mg of N_2 and 3.07 mg of SO_2 . What was the empirical formula of the compound?~~