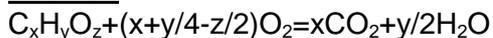


Answer on Question #48772, Chemistry, Other

**Task:**

When 3.62 g of a compound containing carbon, hydrogen, and oxygen were burned completely in air, 5.19 g of CO<sub>2</sub> and 2.83 g of H<sub>2</sub>O were produced. What is the empirical formula of the compound?

**Answer:**



$$v = \frac{m}{M}$$

$$M(CO_2) = 44 \text{ g/mol}$$

$$v(CO_2) = \frac{5.19}{44} = 0.118 \text{ mol}$$

$$v(C) = 0.118 \text{ mol}$$

$$m(C) = vM = 0.118 \cdot 12 = 1.41 \text{ g}$$

$$M(H_2O) = 18 \text{ g/mol}$$

$$v(H_2O) = \frac{2.83}{18} = 0.16 \text{ moles}$$

$$v(H) = 0.16 \cdot 2 = 0.32 \text{ moles}$$

$$m(H) = vM = 0.32 \cdot 1 = 0.32 \text{ g}$$

$$m(O) = 3.62 - 1.41 - 0.32 = 3.2 \text{ g}$$

$$v(O) = \frac{3.2}{16} = 0.2 \text{ moles}$$

$$C:H:O = 0.118:0.32:0.2$$

$$C:H:O = 1:2.66:1$$

After multiplying by 3 we will receive: C:H:O=3:8:3

The final formula is: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>