Answer on Question #76352, Chemistry / General Chemistry :

What is the Emperical Formula of 0.44 gm of CO_2 and 0.27 gm of H_2O

Solution.

$$m(CO_2) = 0.44g$$
$$m(H_2O) = 0.27g$$

$$C_xH_yO_z - ?$$

$$v(CO_2) = \frac{m(CO_2)}{M(CO_2)} = \frac{0.44g}{44g/mol} = 0.01mol$$

$$v(H_2O) = \frac{m(H_2O)}{M(H_2O)} = \frac{0.27g}{18g/mol} = 0.015mol$$

Than:

$$v(C) = v(CO_2) = 0.01mol$$
$$v(O) = 2v(CO_2) = 0.02mol$$
$$v(H) = 2v(H_2O) = 0.03mol$$
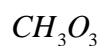$$v(O) = v(H_2O) = 0.01mol$$

$$v_\Sigma(O) = 0.01mol + 0.02mol = 0.03mol$$

And:

$$n(C):n(H):n(O) = v(C):v(H):v(O)$$
$$n(C):n(H):n(O) = 0.01:0.03:0.03$$
$$n(C):n(H):n(O) = 1:3:3$$
$$CH_3O_3$$

Answer: CH_3O_3

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