

Answer on Question 82370 in General Chemistry

$$.m(C_xH_y) = 1.052 \text{ g}$$

$$.m(CO_2) = 3.19 \text{ g}$$

$$.m(H_2O) = 1.63 \text{ g}$$

$$.\omega(H) = ?$$

$$\text{Find the amount of substance of } CO_2 \quad n = \frac{m}{Mr} = \frac{3.19}{44} = 0.0725 \text{ mol}$$

$$Mr(CO_2) = Ar(C) + 2 Ar(O) = 12 + 2 \times 16 = 44$$

$$.n(C) = n(CO_2) = 0.0725 \text{ mol}$$

$$.m(C) = n \times Ar = 0.0725 \times 12 = 0.87 \text{ g}$$

$$\text{Find the amount of substance of } H_2O \quad n = \frac{m}{Mr} = \frac{1.63}{18} = 0.091$$

$$.n(H) = 2 n(H_2O) = 2 \times 0.091 = 0.182$$

$$.m(H) = Ar \times n = 0.182 \times 1 = 0.182$$

$$Mr(H_2O) = 2 Ar(H) + Ar(O) = 2 \times 1 + 16 = 18$$

$$\text{Total weight of compound } m = m(C) + m(H) = 0.87 + 0.182 = 1.052$$

There is no other element except carbon and hydrogen in the compound.

$$.\omega(H) = \frac{m(H)}{m(\text{compound})} \times 100 \% = \frac{0.182}{1.052} \times 100 \% = 17.3 \%$$

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