Answer on Question #63172 - Chemistry - General Chemistry

Question

Propane, C_3H_8, is commonly provided as a bottled gas for use as a fuel. In 0.400 mol of propane what is the mass of propane? What mass of carbon is present? How many molecules of C_3H_8 are present? and how many hydrogen atoms are present?

Solution:

$$m(C_3H_8) = \vartheta(C_3H_8) \cdot M(C_3H_8) = 0.4 \cdot 44 = 17.6 \, (g)$$

$$m(C) = 3 \cdot \vartheta(C_3H_8) \cdot M(C) = 3 \cdot 0.4 \cdot 12 = 14.4 \, (g)$$

$$N(C_3H_8) = \vartheta(C_3H_8) \cdot N_A = 0.4 \cdot 6.02 \cdot 10^{23} = 2.41 \cdot 10^{23}$$

$$N(H) = 8 \cdot N(C_3H_8) = 8 \cdot 2.41 \cdot 10^{23} = 1.93 \cdot 10^{24}$$

Answer:

$$m(C_3H_8) = 17.6 \, (g)$$

$$m(C) = 14.4 \, (g)$$

$$N(C_3H_8) = 2.41 \cdot 10^{23}$$

$$N(H) = 1.93 \cdot 10^{24}$$