

### Question #84761, Chemistry / General Chemistry

A 3.09 L flask is filled with propane gas (C<sub>3</sub>H<sub>8</sub>) at 1.00 atm and -16.4 C. What is the mass of the propane in the flask?

#### Solution

The ideal gas law states:

$PV = nRT$ , where  $n$  – the amount of gas in moles;

$$PV = \frac{m}{M}RT$$

$m = \frac{PVM}{RT}$ , where  $P = 101.3 \text{ kPa}$ ;  $T = 256.75 \text{ K}$ ;  $V = 3.09 \times 10^{-3} \text{ m}^3$ ;  $R = 8.314 \text{ m}^3 \times \text{Pa} \times \text{mol}^{-1} \times \text{K}^{-1}$

$$m = \frac{101.3 \times 10^3 \times 3.09 \times 10^{-3} \times 44.1}{8.314 \times 256.75} = \mathbf{6.47 \text{ (g)}}$$

#### Answer

**6.47 g** is the mass of the propane in the flask.

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