

## Answer on Question #66271 - Chemistry – Organic Chemistry

### Task:

Given a 1.35g sample of O<sub>2</sub> (FM = 32.00). How many liters of volume would it have at 39°C and 879mmHg pressure?

### Solution:

The ideal gas law is often written as  $pV = nRT$ ;

$$n = \frac{m}{M};$$

$$pV = \frac{m}{M}RT.$$

1) Convert all data into proper units

$$R = 0.0821 \text{ L}\cdot\text{atm}/\text{K}\cdot\text{mol};$$

$$T = 39^\circ\text{C} + 273 = 312 \text{ K};$$

$$P = 879 \text{ mm Hg} (1 \text{ atm}/760 \text{ mm Hg}) = 1.1566 \text{ atm}$$

2) We calculate now:

$$V = \frac{m(O_2)RT}{pM(O_2)};$$

$$V(O_2) = \frac{1.35 \cdot 0.0821 \cdot 312}{1.1566 \cdot 32} = 0.9343(L).$$

**Answer:** 0.9343 liters of O<sub>2</sub>.