

Question #63519, Chemistry / General Chemistry

**Data:**

$$P = 1 \text{ atm.} = 101.325 \text{ kPa}$$

$$T = 17^\circ\text{C} = 290 \text{ K}$$

$$m(\text{with air}) = 87.50 \text{ g}$$

$$m(\text{with gas}) = 87.90 \text{ g}$$

$$P(\text{air}) = 1.29$$

$$V = 250 \text{ cm}^3$$

**Find:**

$$M(\text{gas}) = ?$$

**Of solution:**

$$PV = \left(\frac{m}{M}\right) RT$$

$$m = \frac{MPV}{RT} = \frac{29 * 101.325 * 0.25}{8.314 * 290} = 0.3 \text{ g}$$

$$m(\text{ball}) = 87,5 - 0,3 = 87,2 \text{ g}$$

$$m(\text{gas}) = 87,9 - 87,2 = 0,7 \text{ g}$$

$$v = \frac{m}{M}$$

$$v(\text{gas}) = \frac{PV}{RT} = \frac{101.325 * 0.25}{8.314 * 290} = 0.01051 \text{ moll}$$

$$M(\text{gas}) = \frac{m}{v} = \frac{0.7}{0.01051} = 66.6 \text{ g/moll}$$

*Answer:* M=66.6 g/moll