

Question #59833, Chemistry / General chemistry

A 355-mL container holds 0.146 g of Ne and an unknown amount of Ar at 358 kelvin and a total pressure of 626 mmHg. Calculate the amount of moles of Ar present.

Solution

$$n(\text{Ne}) = m/M = 0.146 / 20 = 0.0073 \text{ (mol)}$$

$$pV = nRT$$

$$p(\text{Ne}) = 0.0073 * 8.314 * 358 / 0.000355 = 61205 \text{ (Pa)} = 459.1 \text{ (mmHg)}$$

$$p(\text{Ar}) = p - p(\text{Ne}) = 626 - 459.1 = 166.9 \text{ (mmHg)} = 22250 \text{ (Pa)}$$

$$n(\text{Ar}) = 22250 * 0.000355 / (8.314 * 358) = 0.0026 \text{ (mol)}$$

Answer

$$n(\text{Ar}) = 0.0026 \text{ mol}$$