

Answer on Question #77868, Chemistry / General Chemistry

use the following information: A container has 8360.0 torr of Nitrogen, 5.00 atm of Oxygen, 101.1 kPa of Argon, and 760.0 mm Hg of Carbon Dioxide.

13. What is the total pressure in the container (in atm)?

- A. 8 atm
- B. 12 atm
- C. 15 atm
- D. 18 atm
- E. None of the Above

Solution

To answer this question we should use Dalton's Law of partial pressures, which states that the total pressure of a mixture of gases is equal to the sum of the partial pressures of the component gases:

$$P_{total} = P_{gas1} + P_{gas2} + P_{gas3} \dots$$

$$P_{total} = P_{N_2} + P_{O_2} + P_{Ar} + P_{CO_2}$$

$$P_{N_2} = 8360.0 \text{ torr} = 8360.0 \times 0.00132 = 11.04 \text{ atm}$$

$$P_{Ar} = 101.1 \text{ kPa} = 101100 \text{ Pa} = 101100 \times 9.869 \times 10^{-6} = 0.998 \text{ atm}$$

$$P_{CO_2} = 760.0 \text{ mm Hg} = 760.0 \times 0.00132 = 1 \text{ atm}$$

$$P_{total} = P_{N_2} + P_{O_2} + P_{Ar} + P_{CO_2} = 11.04 + 5.00 + 0.998 + 1 = 18.04 \text{ atm} \cong 18 \text{ atm}$$

Answer: D. 18 atm