

## Unit 8A – Manometers & Gas Laws Twitter Review Questions

U8A-1: Ar gas exerts pressure on Hg rising 465 mmHg on atmospheric arm. Find pressure of Ar gas (kPa) if atmospheric pressure is 1.42 atm.

- Answer:  $P_{\text{gas}} = 206 \text{ kPa Ar}$

U8A-2: Hg rises 155 mm higher on gas arm. Calculate the atmospheric pressure (mmHg) if gas pressure exerted is 87.1 kPa.

- Answer:  $P_{\text{atm}} = 808 \text{ mmHg}$

U8A-3: Calculate the height (mmHg) that Hg rises on gas arm if gas pressure exerted is 0.780 atm and atmospheric pressure is 112.8 kPa.

- Answer:  $h = 253 \text{ mmHg}$

U8A-4: What is the pressure (kPa) of nitrogen gas if its pressure exerted causes Hg to rise 145 mm.

- Answer:  $P_{\text{gas}} = "h" \rightarrow P_{\text{gas}} = 19.3 \text{ kPa}$

U8A-5: What is the atmospheric pressure (atm) if gas exerted is 135.5 kPa and Hg rises 208 mm on atmospheric arm?

- Answer:  $P_{\text{atm}} = 1.06 \text{ atm}$

U8A-6: A gas takes up 17.0L, pressure of 2.30atm, and temp. of 299K. If temp. rises to 350.K & pressure lowered to 1.50atm, find new volume.

- Answer: Gay-Lussac's  $\rightarrow V_2 = 30.5 \text{ L}$

U8A-7: What volume change occurs to a 400.0 mL gas sample as the temperature increases from 22.0 °C to 30.0 °C?

- Answer: Charles'  $\rightarrow V_2 = 411 \text{ mL} / 11.0 \text{ mL volume change}$

U8A-8: If I have a 50.0L container that holds 45.0 moles of gas at a temperature of 200.°C, what is the pressure (atm) inside the container?

- Answer: Ideal Gas  $\rightarrow P = 34.9 \text{ atm}$

U8A-9: A He balloon contains 7.20L. Pressure is reduced to 2.00atm & balloon expands to 25.1L. What was initial pressure exerted on balloon?

- Answer: Boyle's  $\rightarrow P_1 = 6.97 \text{ atm}$

U8A-10: Pressure of N<sub>2</sub>, CO<sub>2</sub>, & O<sub>2</sub> is 150. kPa. What is pressure of O<sub>2</sub> if pressures of N<sub>2</sub> and CO<sub>2</sub> are 100. kPa and 24.0 kPa, respectively?

- Answer: Partial Pressure  $\rightarrow P_{\text{O}_2} = 26.0 \text{ kPa}$

U8A-11: If a gas at 740. mmHg and 70.0 °C has its pressure lowered to 720. mmHg, what will its temperature be if volume remains constant?

- Answer: Gay-Lussac's  $\rightarrow T_2 = 334\text{K}$

U8A-12: A sample of neon occupies a volume of 461 mL at STP. What will be the volume of the neon when the pressure is reduced to 93.3 kPa?

- Answer: Boyle's  $\rightarrow V_2 = 501\text{ mL Ne}$

U8A-13: On a 27.0°C day, a cylinder contains 20.0 L of air. At night it only holds 19.0 L. What is the temperature (°C) at night?

- Answer: Charles'  $\rightarrow T_2 = 12.0^\circ\text{C}$

U8A-14: A compressed gas at STP is heated to 40.0 °C. Find its final pressure in kPa if the volume remains constant.

- Answer: Gay-Lussac's  $\rightarrow P_2 = 116\text{ kPa}$

U8A-15: If I have 2.9L of gas at 5.0atm & 50. °C, what will be temp of gas if volume is decreased to 2.4L and pressure decreased to 3.0atm?

- Answer: Combined Gas  $\rightarrow T_2 = 160\text{K}$

U8A-16: How many moles of gas are in a 30.0 L scuba canister if the temperature of the canister is 300. K and a pressure of 200. atm?

- Answer: Ideal Gas  $\rightarrow n = 244\text{ moles}$

U8A-17: Find total pressure (atm) of mixture containing six gases with pressures of 3.25kPa, 4.45kPa, 1.34kPa, 6.42kPa, 4.58kPa, & 3.54kPa.

- Answer: Partial Pressure  $\rightarrow P_{\text{Total}} = 0.233\text{ atm}$

U8A-18: A 500. mL glass with air is inverted in H<sub>2</sub>O at 7.00°C. H<sub>2</sub>O is heated to 77.0°C. What volume of air leaks out from glass?

- Answer: Charles'  $\rightarrow V_2 = 625\text{ mL}$

U8A-19: A container holds 500. mL of CO<sub>2</sub> at 20.0° C & 742 Torr. What will be the volume of the CO<sub>2</sub> if pressure is increased to 795 Torr?

- Answer: Boyle's  $\rightarrow V_2 = 467\text{ mL CO}_2$

U8A-20: A balloon can hold 100. L of air. If I blow it up with 3.00 moles of oxygen at 101.3 kPa, what is the temp. (°C) of the balloon?

- Answer: Ideal Gas  $\rightarrow T = 133^\circ\text{C}$