

NAME:

HONORS CHEMISTRY

SECTION:

Dalton's Law of Partial Pressures

Dalton's Law of Partial Pressures states that the sum of the individual pressures of all the gases that make up a mixture is equal to the total pressure exerted by the mixture.

$$P_{tot} = P_1 + P_2 + P_3 \dots$$

Clues that a problem involves Dalton's Law of Partial Pressures:

- The gas is collected by water displacement
- The gas is collected over water
- The question asks about the dry gas
- The question gives you the vapor pressure of water

Level 1 Problems

For problems 1-3, use the data in Table 1.

Show all your work!

1. A gas is collected by water displacement at 45°C at a total pressure of 113.45 kPa. What is the partial pressure exerted by the gas?

2. A gas is collected over water at a temperature of 25°C. The total pressure is 97.18 kPa. Determine the partial pressure exerted by the gas.

Table 1. Vapor pressure of water at various temperatures

Temperature (°C)	H ₂ O Pressure (kPa)
0	0.61
5	0.87
10	1.25
15	1.71
20	2.34
25	3.17
30	4.25
35	5.63
40	7.38
45	9.59
50	12.34
55	15.75

3. The air pressure over a pond at 15°C is 101.75 kPa. What is the partial pressure of the dry air?

4. A 250. mL sample of oxygen is collected over water at 25°C and 760.0 torr pressure. What is the pressure of the dry oxygen alone? The vapor pressure of water at 25°C is 23.8 torr.

