



Name: \_\_\_\_\_

Hour: \_\_\_\_\_

## PVTn Worksheet

### Relationship between pressure and volume:

A sample of gas has a volume of 46.0 mL when measure at 35.0°C and 4.2 atm. What pressure will the gas have at the same temperature and a new volume of 40.0 mL?

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

### Practice

1. What would be the new pressure if 250 cm<sup>3</sup> of gas at standard pressure is compressed to a volume of 150 cm<sup>3</sup> ? (\_\_\_\_\_ = constant)

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

2. 20.0 L of a gas has a pressure of 2.2 atm. The gas is injected into a 50.0L tank. What is the new pressure of the gas? (\_\_\_\_\_ = constant)

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

## Relationship between number of puffs and pressure

Suppose gas is known to contain 3.0 puffs and has a pressure of 6.0atm. If the amount of gas is increased to 5.0 puffs, what new pressure will result when volume and temperature are held constant?

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

### Practice

3. A closed flask of air (0.250L) contains 5.0 “puffs” of particles. The pressure probe on the flask reads 93 kPa. A student uses a syringe to add an **additional** 3.0 “puffs” of air through the stopper. Find the new pressure inside the flask. (   = constant)

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

## Relationship between temperature and pressure

A gas has a pressure of 1.2 atm at 40.0 °C. What is the temperature at standard pressure?

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

### Practice

4. The pressure in a bicycle tire is 105 psi at 25°C in Fresno. You take the bicycle up to Huntington, where the temperature is – 5°C. What is the pressure in the tire?

(V and n = constant)

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

5. The pressure of oxygen gas inside a canister is 5.00 atm at 25.0°C. The canister is located at a ski resort on the top of Vail Mountain. If the temperature drops to -10.0 °C, what is the new pressure inside the canister? (\_\_\_\_\_ = constant)

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_  
remember sig. figs. and units

### Relationship between temperature and volume

A sample of gas occupies 230 mL at 15°C and 0.95 atm. What temperature will the gas have when it occupies a volume of 237 mL and 0.95 atm?

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_  
remember sig. figs. and units

### Practice

6. A helium filled balloon in a closed car occupies a volume of 3.21 L at 25.0 °C. If the car is parked on a hot day and the temperature inside the car rises to 75.0 °C, what is the new volume of the balloon, assuming the pressure remains constant?

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_  
remember sig. figs. and units

7. A sample of gas occupies 150 mL at 25 °C. What is its volume when the temperature is increased to 50°C? (P and n = constant)

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_  
remember sig. figs. and units

## Combined Gas Law

What would be the new volume if 250 cm<sup>3</sup> of gas at 25°C and 1.5 atm pressure were changed to standard conditions of temperature and pressure? (\_\_\_ = constant)

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

### Practice

8. A 350 mL sample of gas has a temperature of 30.0°C and a pressure of 1.20 atm. What temperature would be needed for the same amount of gas to fit into a 250 mL flask at standard pressure?

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*

9. If 12.0 L of CO at 2.00 atm is injected into a 20.2L tank and heated from 301 K to 420 K, what is the new pressure?

|         | P | T | V | n |
|---------|---|---|---|---|
| Initial |   |   |   |   |
| Final   |   |   |   |   |
| Change  |   |   |   |   |
| Effect  |   |   |   |   |

Answer \_\_\_\_\_

*remember sig. figs. and units*