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

**Gas Laws Worksheet**

1. If 22.5 L of nitrogen gas at a pressure of 748 mmHg is compressed to 725 mmHg at constant temperature, is the new volume less than or greater than 22.5 L? What is the new volume? *Draw particle diagrams to support your answer.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **P** | **T** | **V** |
| **Initial** |  |  |  |
| **Final** |  |  |  |
| **Effect** |  |  |  |

1. A gas with a volume of 4.0 L at a pressure of 205 kPa is allowed to expand to a volume of 12.0 L. Is the new pressure in the container greater than or less than 205 kPa if the temperature remains constant? What is the new pressure? *Draw particle diagrams to support your answer.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **P** | **T** | **V** |
| **Initial** |  |  |  |
| **Final** |  |  |  |
| **Effect** |  |  |  |

1. Determine if the temperature increases or decreases when 6.00 L of gas at 20.0°C is compressed to 4.00 L. Then determine the new temperature. *Draw particle diagrams to support your answer.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **P** | **T** | **V** |
| **Initial** |  |  |  |
| **Final** |  |  |  |
| **Effect** |  |  |  |

1. A container containing 5.00 L of a gas is collected at 100 K and then allowed to expand to 20.0 L. Do you need to increase or decrease the temperature in order to maintain the same pressure? What new temperature is needed? *Draw particle diagrams to support your answer.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **P** | **T** | **V** |
| **Initial** |  |  |  |
| **Final** |  |  |  |
| **Effect** |  |  |  |

1. The gases in a hair spray can are at a temperature of 27°C and a pressure of 30 psi. If the gases in the can reach a pressure of 90 psi, the can will explode. Is it likely to explode at higher temperatures or at lower temperatures? What temperature will make it explode? You can assume that the volume of the can remains constant. *Draw particle diagrams to support your answer.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **P** | **T** | **V** |
| **Initial** |  |  |  |
| **Final** |  |  |  |
| **Effect** |  |  |  |

1. If 10.0 liters of oxygen at STP are heated to 512 °C, will the new volume of gas be greater than or less than 10.0 L if the pressure is also decreased to 520.0 mmHg? What is the new volume? *Draw particle diagrams to support your answer.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **P** | **T** | **V** |
| **Initial** |  |  |  |
| **Final** |  |  |  |
| **Effect** |  |  |  |

1. A balloon contains 2.0 units of helium and only has a volume of 500 cm3. Should units of helium be added or removed in order to give the balloon a volume of 1000 cm3? How many units will be in the balloon after the change. (P and T = constant) *Draw particle diagrams to support your answer.*

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

1. A closed flask of air (constant volume) 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. Is the new pressure inside the flask going to be higher or lower than 93 kPa. What is this pressure? *Draw particle diagrams to support your answer.*

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