Science Virtual Learning

MPI Physics 240

Thermodynamics 19:
Temperature Change in Gases

May 18, 2020

Lesson: MPI Thermodynamics 19
Temperature Change in Gases
May 18, 2020

Objective: To be able to calculate the temperature change when heat is added to a gas at constant volume or pressure

This video discusses the factors that determine the temperature change when heat is added to a gas, under different conditions

https://youtu.be/_ey41Zg61ZQ

Video: Temperature Change in Gases

Example Video

A container holds 5.00 L of a monatomic gas, initially at 1.00 atm of pressure and a temperature of 12.0°C. 35.0 J of heat are added to the gas. How much does the temperature of the gas change if

a) the container cannot expand

b) the container can expand at constant pressure?

Video: https://youtu.be/ZN6QOz1QwOk

Homework 1

- Try to solve the problem yourself, then watch the solution video:
- https://youtu.be/h4jIDsitaFI

1. A 1.50 L balloon contains a monatomic gas, initially at 14.3°C. The outside air keeps the balloon at a constant pressure of 1.00 atm. How much heat would you have to add to raise the temperature of the air by 5.0°C?

Homework 2

- Try to solve the problem yourself, then watch the solution video:
- https://youtu.be/Ux29FjIcp5U

2. A 0.500-L Mason jar contains a diatomic gas at constant volume. When 2.68 J of heat are removed from the gas, its temperature lowers by 15.9°C. How many moles of gas are in the jar?

That’s it!