Science Virtual Learning

MPI Physics 240

Thermodynamics 13: Molecular Speed

May 8, 2020

Lesson: MPI Thermodynamics 13 – Molecular Speed
May 8, 2020

Objective: To understand how the speed of the molecules in a gas depends on temperature

This video discusses how the speed of the molecules in a gas varies with temperature

https://youtu.be/k9VA7h6D2_o

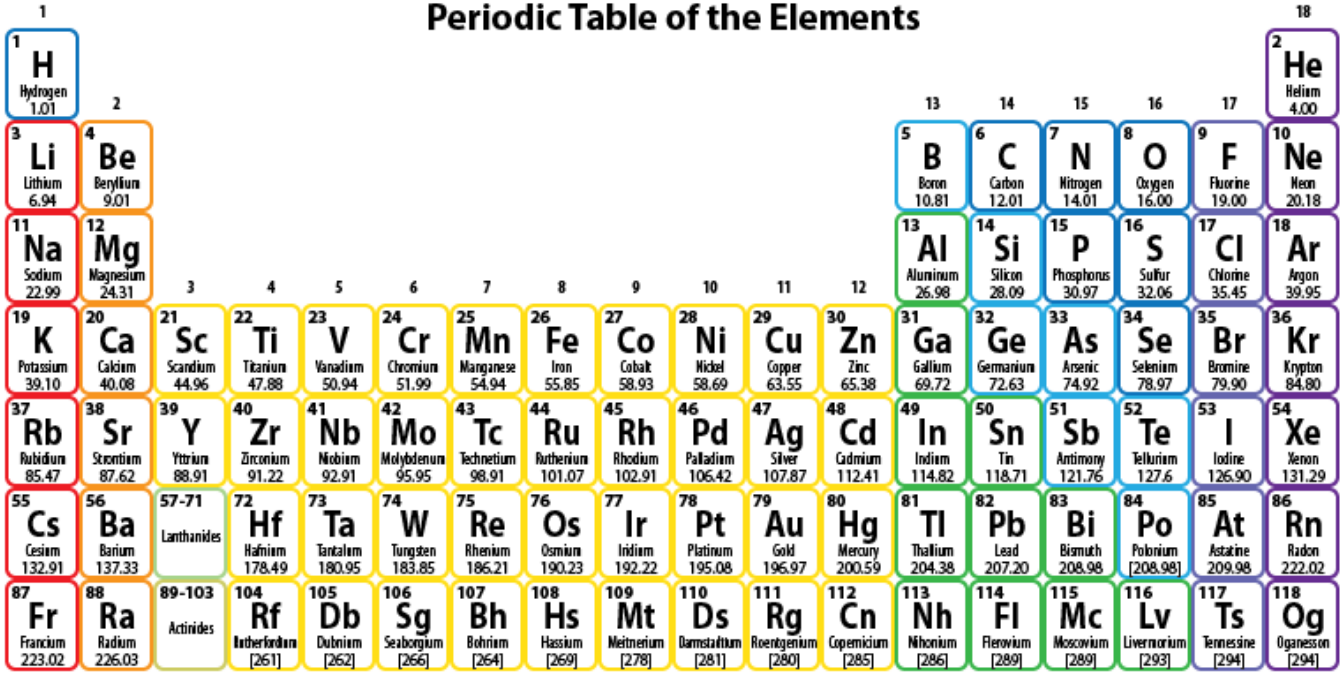
Video: Molecular Speed

What is the v_{rms} of nitrogen gas (N_2) at 20.0°C?

_____

Molecular Speed - Example

Periodic Table of the Elements



Homework 1

- Try to solve the problem yourself, then watch the solution video:
- https://youtu.be/Ezm6XIGiaUg

HW 1: Besides nitrogen, the other main components of the atmosphere are oxygen gas (O_2) and argon. If they are both at 20.0°C, find for each:

a) the mass of a single molecule, in kg.

b) their v_{rms}

Homework 2

- Try to solve the problem yourself, then watch the solution video:
- https://youtu.be/YdclVH0tn70

HW 2: In an example, we found nitrogen gas at 20.0°C travels at 511 m/s. At what temperature would chlorine gas (Cl_2) travel at the same speed?

That’s it!