Chemical Thermodynamics

- Joule-Thompson expansion depends on non-ideal characteristics of gases.
- Compare NH₃ and He in a Joule-Thompson expansion for P₁=100 bar to P₂=1 bar at an initial temperature of 260 K.

Continue comparison between NH₃ and He.

 Difference between NH₃ and He due to differences in intermolecular forces.

 Continuously repeating a Joule-Thompson expansion is the basis for a refrigerator

Ideal coolant

Look at intermolecular forces to determine an ideal refrigerant.

 C_p/C_v

- Most chemistry done at constant pressure (so C_p is typically tabulate) but most equations involve C_v.
- Convert between C_p and C_v.

 C_p/C_v

- Relationship between C_p and C_v dependent on equation of state.
- For an ideal gas:

C_p/C_v

For a solid block of iron: