Statistical Mechanics

Molecular partition function

- Identical, indistinuishable particles.

- Need to account for degeneracy of states.

- Back to monoatomic ideal gas

Molecular partition function

- For monoatomic gas both electronic and translation degrees of freedom are present.

- Molecular partition function.

- Partition Function

q$_{elec}$

- Energy level diagram

- q$_{elec}$

q~trans~

- Particle-in-a-box energies

- Degeneracy, g_i

- q_{trans}

q~trans~

- Average energy spacing between levels

- Replace sum with integration

Q for monoatomic ideal gas

- Put both into partition function expression.

- Q

Q for ideal gas mixture

- Q contains two different ideal gases

- <E>

- <P>

Q for diatomic ideal gas

- Extra molecular partition functions

- Q