

1. What is the connection, if any, between a , the occupation number, and Ω , the degeneracy?

2. In the notes, I have $S = k \sum (P_j \log P_j)$, but in the book the author uses the natural log. Did I write it down wrong in the notes or are we too assume log base e ?

3. When a variable has a bar over it, does that express a time average or just an average over all the microstates at one specific time?

I thank you for your time.

Hi

The occupation numbers, a , were variables introduced to help us derive the probability distribution $P_{\{i\}}$ in the canonical ensemble. They don't have any direct relation to Ω , the degeneracy at a particular energy.

In all expressions using logarithms, you should assume log base e . The only exception is the formula from information theory which is log base 2 (McQuarrie doesn't cover this part).

>From a practical point of view, any variable with a bar over it corresponds to an average over all the microstates (time is not involved). The 1st postulate of stat mech states that an appropriately weighted average over all microstates is equivalent to performing a time average.

Hope that helps,
Anton