

CHAPTER OVERVIEW

6: The Grand Canonical Ensemble

In the grand canonical ensemble, the control variables are the chemical potential μ , the volume V and the temperature T . The total particle number N is therefore allowed to fluctuate. It is therefore related to the canonical ensemble by a Legendre transformation with respect to the particle number N . Its utility lies in the fact that it closely represents the conditions under which experiments are often performed and, as we shall see, it gives direct access to the equation of state.

[6.1: Thermodynamics](#)

[6.2: Partition Functions](#)

[6.3: Ideal Gas](#)

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