Quiz 4, due 5pm, Thursday 4/16

1. Gibbs free energy

Construct a thermodynamic potential with natural variables temperature T, pressure p, and particle number N: Gibbs free energy $G(T, p, N)$.

a) Derive the thermodynamic identity for G.

b) Calculate all Maxwell relations that can be derived from G.

c) Show that for extensive systems the chemical potential is given by:

$$\mu = \frac{G}{N}$$