

Homework assignment #4 for CCB 425/525, Spring 2017

1. Show that $U = -(\partial \ln Z / \partial \beta)$.
2. Derive the “quantum correction” formula, Eq. 30 of Herschbach, Johnston & Rapp.
3. For Marcus theory, evaluate $\langle V_B - V_A \rangle_B$; show your work.
4. Problem 9.17 in Dill & Bromberg
5. Problem 13.7 in Dill & Bromberg. Hint: set $\xi = n_B(t) - n_B(0)$, where n_B is the number of moles of B.

This assignment should be turned in at class on Wednesday, March 1. Please show your work for all problems!

Homework assignment #5 for CCB 425/525, Spring 2017

1. Show that the following is a formal solution to the Langevin equation:

$$\mathbf{v}(t) = \mathbf{v}_0 e^{-\zeta t} + e^{-\zeta t} \int_0^t e^{\zeta x} \mathbf{A}(x) dx$$

2. Assuming that the ensemble average of the stochastic force is zero (i.e. $\langle A(t) \rangle = 0$), derive an equation for the ensemble average $\langle \mathbf{v} \rangle (t)$.
3. Problem 24.1 in Dill & Bromberg
4. Problem 24.2 in Dill & Bromberg

This assignment should be turned in at class on Wednesday, March 8. Please show your work for all problems!