Academic Honesty Policy. Academic honesty is strictly enforced on quizzes, exams, and other aspects of this course. Academic dishonesty will result in a failing grade in the class and a letter in the student's file. Activities constituting academic dishonesty include:

Cheating
- Copying from others during an examination.
- Communicating exam answers with other students during an examination.
- Offering another person's work as one's own.
- Taking an examination for another student or having someone take an examination for oneself.
- Tampering with an examination after it has been corrected, then returning it for more credit.
- Using unauthorized materials, prepared answers, written notes, or concealed information during an examination.

Dishonest Conduct
- Stealing or attempting to steal an examination or answer key from the instructor.
- Allowing another student to copy off of one's own work during a test.

Collusion
- Any student who knowingly or intentionally helps another student perform any of the above acts is subject to discipline for academic dishonesty.

I understand and will abide by this academic honesty policy: ____________________________ (signature) Seat: _______

1. Bromine exists as two isotopes, $^{79}\text{Br}$ and $^{81}\text{Br}$, which for all intents and purposes are identical in their chemical properties (reactivity, bond strength, etc.). (5 pts)

   a. Draw an energy diagram for the substitution reaction involving $^{79}\text{Br}$ and $^{81}\text{Br}$ that is shown below. (Hint: In thinking about the mechanism of the reaction, consider the reactions discussed in class.)

   \[
   \text{Ph}_3\text{C} - ^{79}\text{Br} + ^{81}\text{Br}^- \rightleftharpoons \text{Ph}_3\text{C} - ^{81}\text{Br} + ^{79}\text{Br}^- 
   \]

   b. Properly label the axes, reactants, intermediates, products, and transition states in your diagram.

   c. What is the heat of reaction, $\Delta H^o$? __________

2. Use full-headed or half-headed curved arrows to show the movement of electrons in this reaction. (Smith, 6.25f, 2 pts)

3. Draw the products of this reaction by following the curved arrows. (Smith, 6.26c, 2 pts)

4. (Smith, 6.34b, 1 pt) In a unimolecular reaction with five times as much starting material as product at equilibrium, is $\Delta G^o$ negative or positive? __________