Discussion Worksheet #7

Compare/contrast Sn1/Sn2/E1/E2

Skill 1: Predict the major mechanism and draw major products

* Alkyl halides can potentially undergo substitution and/or elimination reactions. In some cases there is one predominant mechanism
* Compare key factors in making the decision.
  + First, look at substrate. 3o precludes Sn2, 1o/methyl precludes Sn1/E1
  + Second, look at the Nu;-/B:
    - Strong nucleophiles favor Sn2
    - Strong bases favor E2
    - Weak nucleophiles disfavor Sn2 compared to Sn1
    - Weak bases disfavor E2 compared to E1
  + Solvents have minor effects—polar aprotic solvents will help favor Sne
  + Leaving groups do not generally help distinguish Substitution vs elimination
    - But if the LG is poor, no reaction will occur!
* Once you have determined the predominant mechanism(s), predict the product using all the concepts previously learned
  + Consider regiochemistry when important!
  + Consider stereochemistry when important!

Problem 1. Draw full mechanisms, including all intermediates and arrows, for the following three reactions. Indicate whether the reaction mechanism is SN1, SN2, or E1.



Problem 2. Draw the major product(s) of each reaction and specify the most likely mechanism(s) by which it(they) is/are formed ( SN1, SN2, E1, E2, or more than one of these.)

