13. Use a Newman projection, about the C2C3 bond, to draw the three staggered conformers of 3,3-dimethylhexane. Assuming a Me-Me gauche = 0.9 Kcal/mol; Me-Et gauche = 1.2 kcal/mol and Et-Et gauche = 1.4 kcal/mol. Calculate the total PE for each conformer and indicate which one is the most stable.

14. Draw the two conformations of trans-1,4-diethylcyclohexane, and indicate which conformation is more stable.

15. A new halogenating reagent (E2) has been recently discovered. Consider the following reaction using E2. (HE is eliminated)

From the % yields calculate the relative reactivity of the 3°, 2° and 1° hydrogens toward E.
16a. Write equation for the rate-determining step of the following two reactions and calculate ΔH for each RDS equation. (Use the "Official mechanism"). (8 pts)

16b. Draw a crude Rx Path vs. PE for the FORMATION OF THE intermediate in the two above reactions clearly showing the closeness of the energy of the transition state and intermediate in endothermic reactions and the closeness of the energy of the TS and reactants in exothermic reactions. Label TS, intermediates, and ΔH of each reaction profile. (10 pts)

16c Which of the above reactions has more bond breaking in TS? (3 pts)

17. Write the structure of the major product formed in the free-radical bromination of ethylcyclopentane. (4pts)

BONUS: Write the 3-D structures of the two trans isomers of 2,3-dibromodecalin. (The bridgehead carbon is numbered 1).