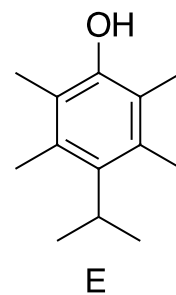
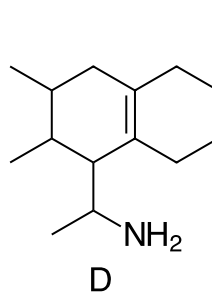
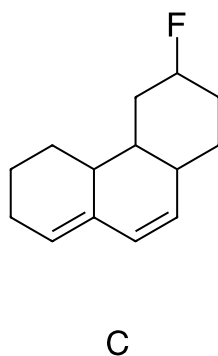
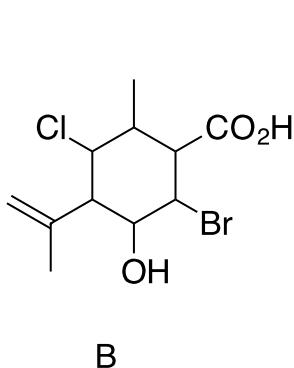


25 pts 1):

The table below lists several simple chemical tests in the rows and some organic compounds in the columns. Place a "+" in the table to indicate a positive result for the test and a "0" to indicate a negative test. (Consider solubility a positive test and insolubility a negative test for H₂O, H₂SO₄, HCl, and NaOH. A positive test for NaHCO₃ is evolution of CO₂ bubbles).

	ethanol	B	C	D	E
H ₂ O solubility					
aq HCl solubility					
aq NaOH solubility					
conc H ₂ SO ₄ solubility					
NaHCO ₃					
Decolorizes Br ₂ / CCl ₄					



200 points total

30pts 2) For each statement below, write S_N1 , S_N2 , E1, or E2 if the statement applies to that mechanism. (Some statements are applicable to more than one mechanism)

a) Does not involve a carbocation intermediate_____

b) Is first order in haloalkane and zero order in nucleophile_____

c) Involves inversion of configuration at site of substitution_____

d) Is first order in haloalkane and first order in base_____

e) Rearrangements may occur_____

f) Order of reactivity of haloalkanes is $3^\circ > 2^\circ > 1^\circ$ _____

25 pts 3) Circle the compound in each pair that you would expect to react more rapidly as a substrate via S_N2 mechanism:

a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$ or $(\text{CH}_3)_2\text{CHBr}$

b) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{F}$ or $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$

c) $(\text{CH}_3)_2\text{CHNH}_2$ or $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$

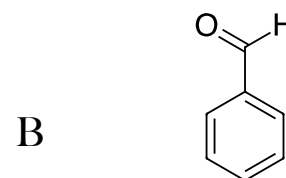
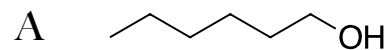
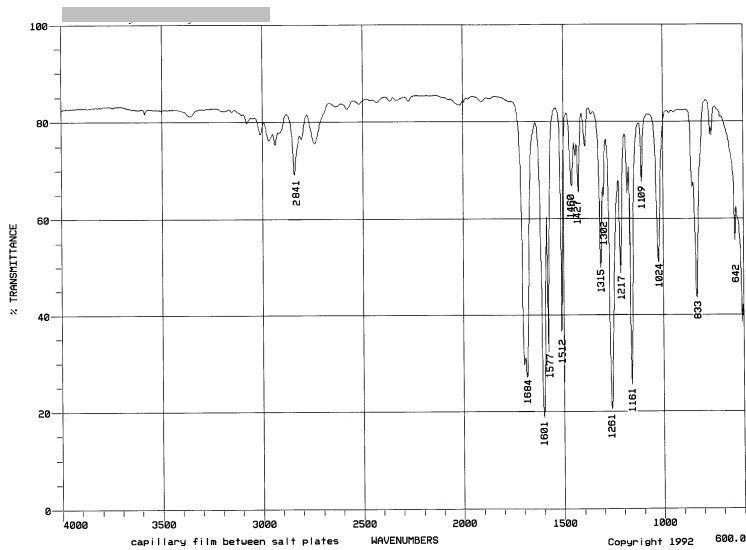
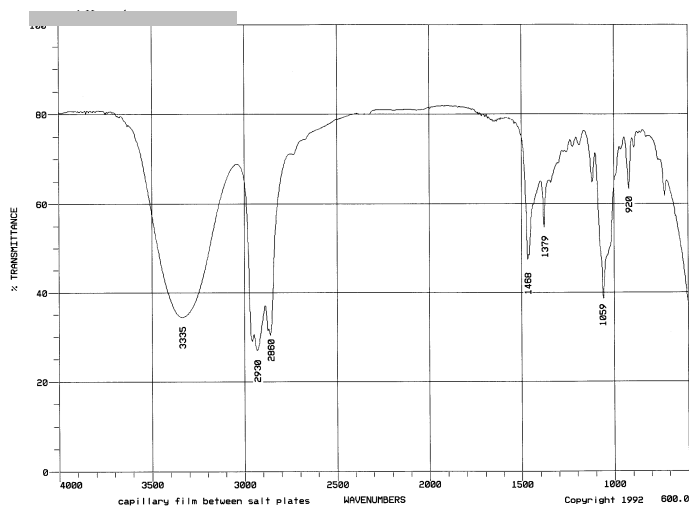
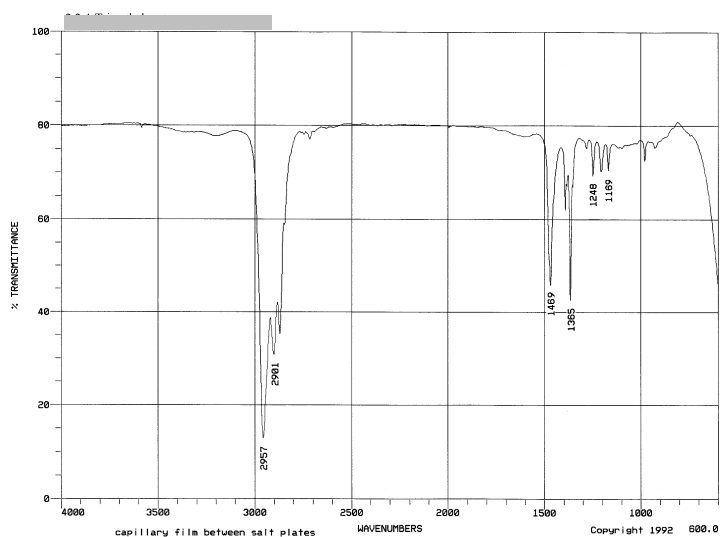
d) $(\text{CH}_3\text{CH}_2)_2\text{CHOH}$ or $(\text{CH}_3\text{CH}_2)_2\text{CHOCOCH}_3$

e) $\text{CH}_3\text{CH}_2\text{I}$ or $\text{CH}_3\text{CH}_2\text{OH}$

200 points total

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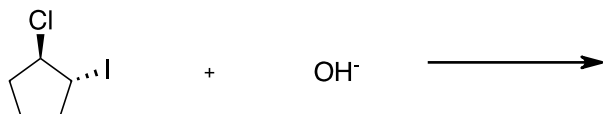
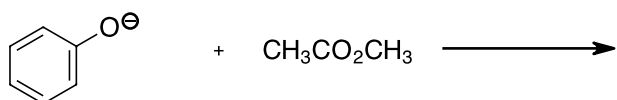
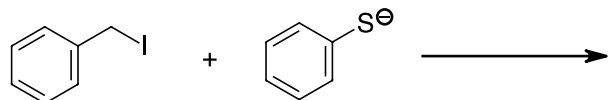
30 pts 4) For the structures below, associate the structure with its IR spectrum (place the correct letter prominently on the spectrum).



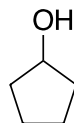
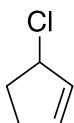
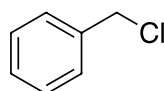
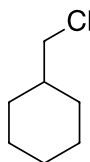
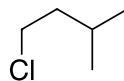
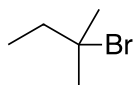
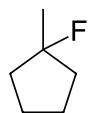
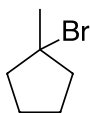
200 points total

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20 pts 5) Show the expected major product for the following S_N2 reactions:

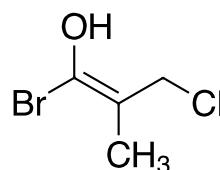
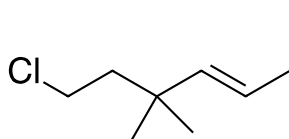


20 pts 6) Circle the compound in each pair that would undergo solvolysis in aqueous methanol more rapidly:



20 pts 7) a) Draw the structure of 2,3,5,5-tetramethyl-2-hexene:

b) Give the IUPAC names for the compound on the left and state whether the compound on the right is (Z)- or (E)-



30 pts 8) Show the expected major products of the reactions below:

