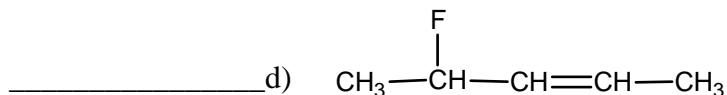
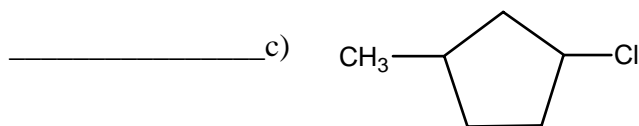
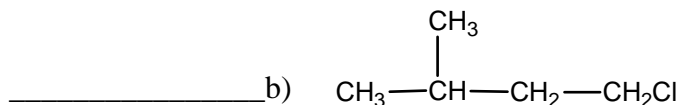
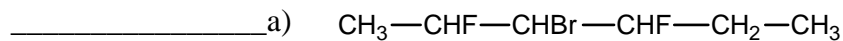


Circle the letter corresponding to the best answer or provide the answer when indicated:

Stereochemistry

1. How many stereoisomers does each of the following compounds have?

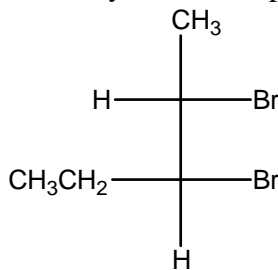


2. Indicate whether the following statements are true (T) or false (F) :

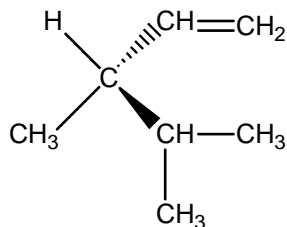
_____ a) R- compounds are dextrorotatory.

_____ b) R - 2 - chlorobutane and S - 2 - chlorobutane have the same refractive index.

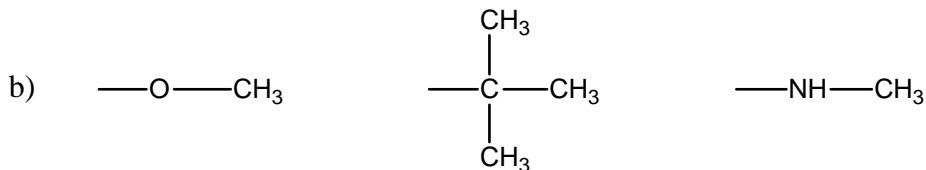
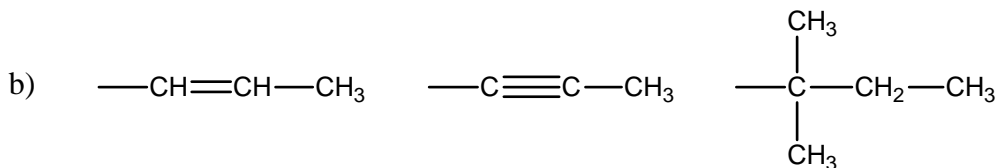
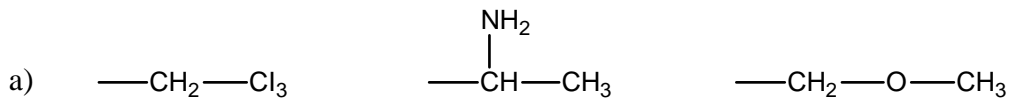
_____ c) The stereochemistry of the compound below is (2S, 3R).



_____ d) The stereochemistry of the compound below is R.



3. In each of the following groups, circle the substituent with the highest priority in the Cahn – Ingold – Prelog system:



4. If a solution of 5 grams of aspartame in 50 ml of water has an observed rotation of -2° in a 10 cm polarimeter tube, what is the specific rotation of aspartame?

_____°

5. If the specific rotation of R – 2 – methyl – 1 – butanol is $+5.76^\circ$, what is the composition of an R/S mixture of 2 – methyl – 1 – butanol which gives a specific rotation of -0.576° ?

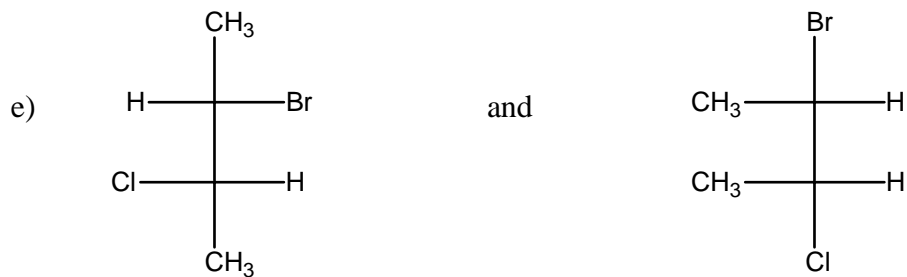
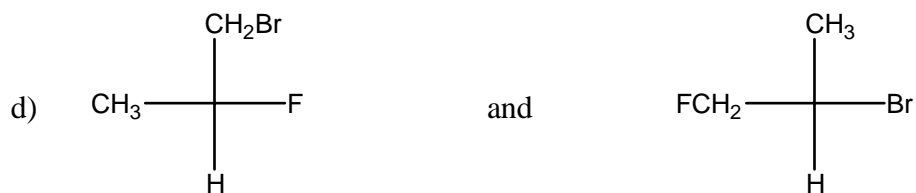
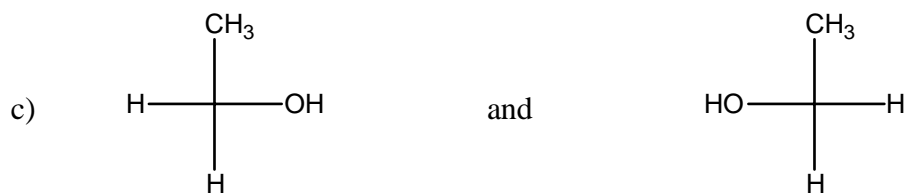
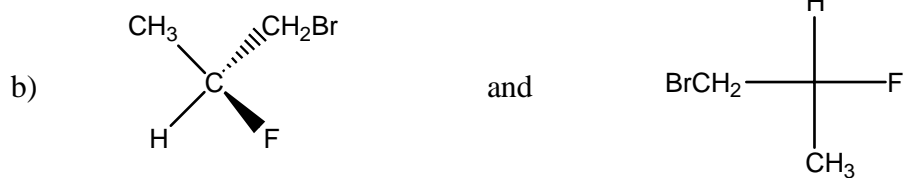
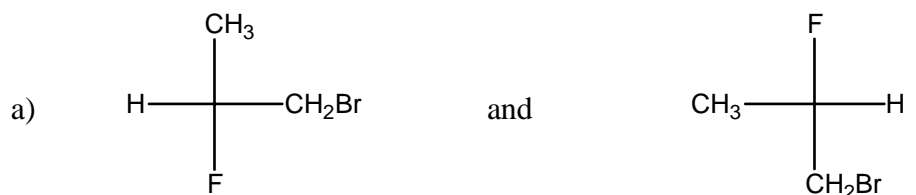
_____ %R

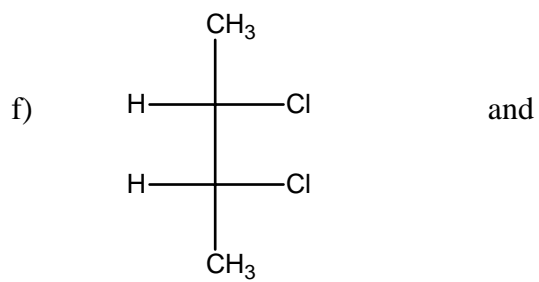
_____ %S

6. Indicate the relationship between the pairs of compounds below using the following descriptions:

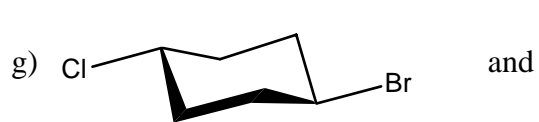
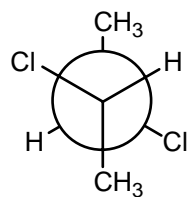
I – identical
 E – enantiomers
 D – diastereomers

U – Unrelated
 C – constitutional isomers

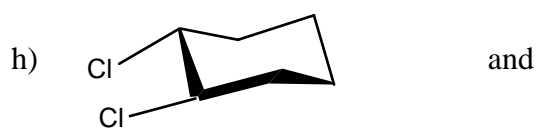




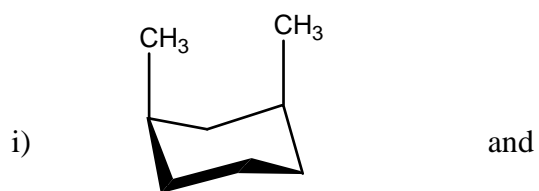
and



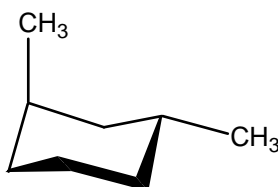
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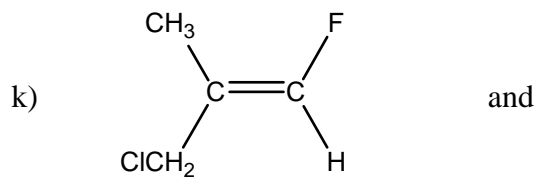
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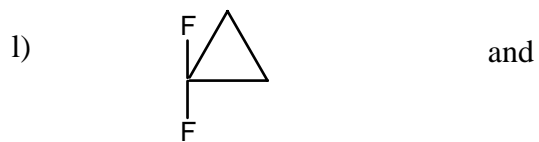
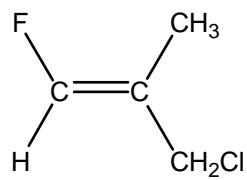
and



and

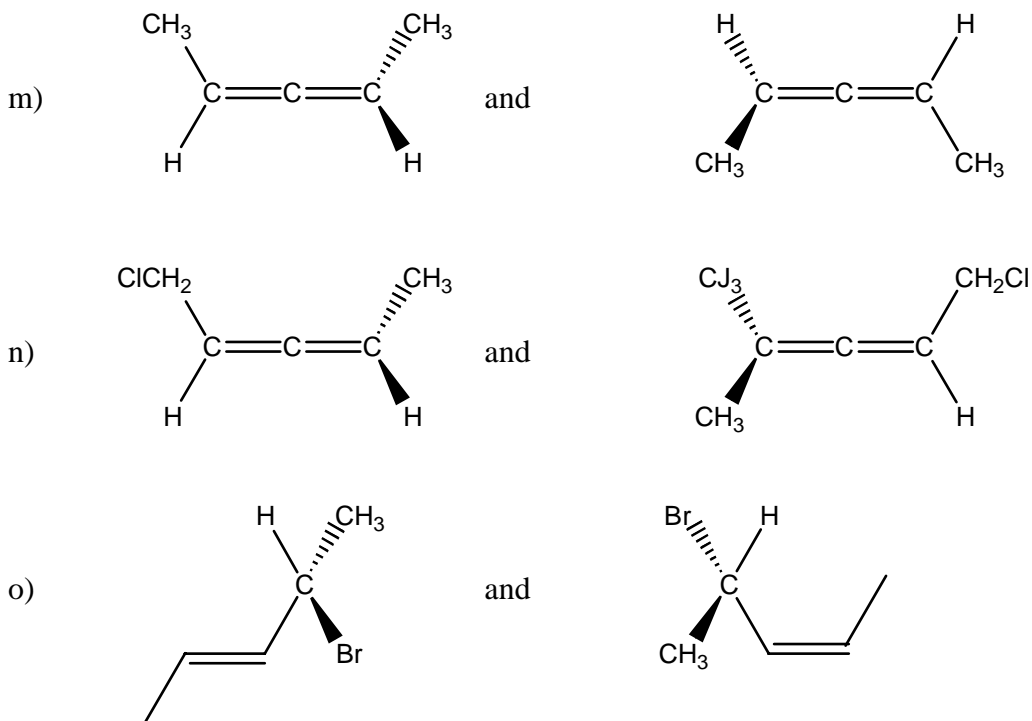


and



and





Ionic Reactions

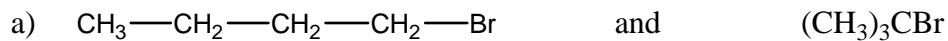
1. In each of the following groups, circle the strongest nucleophile in the indicated solvent.



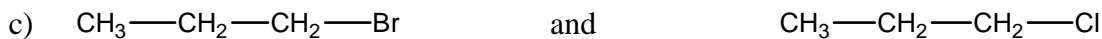
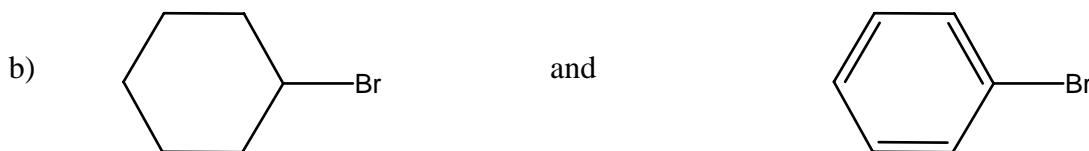
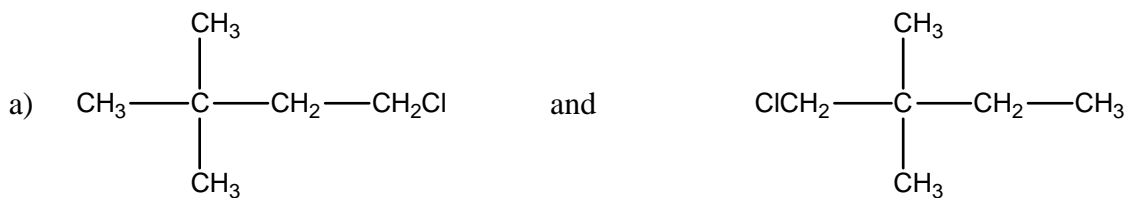
2. Which of the following is the best leaving group?



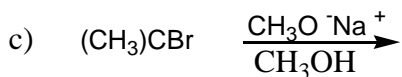
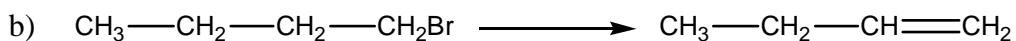
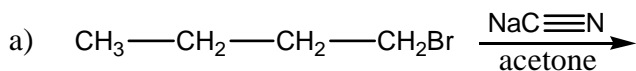
3. In each of the following pairs, circle the compound which is most reactive in an S_N1 reaction:

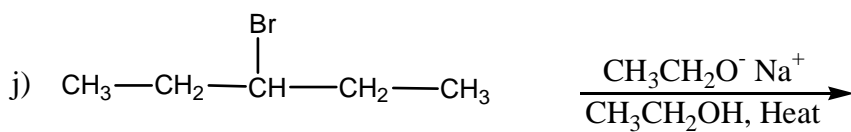
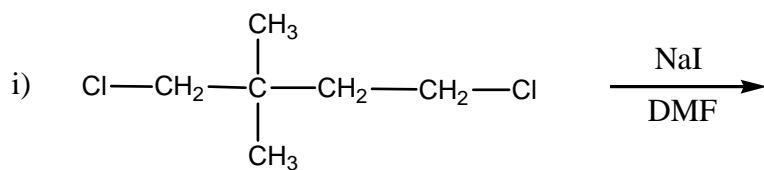
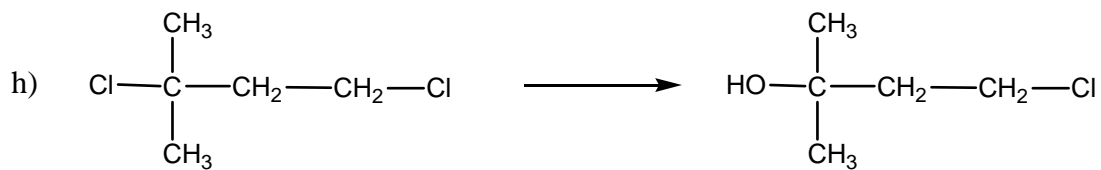
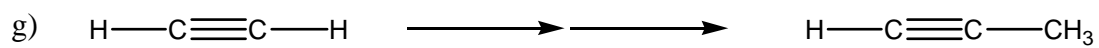
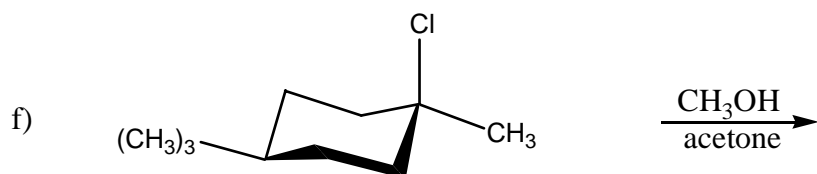
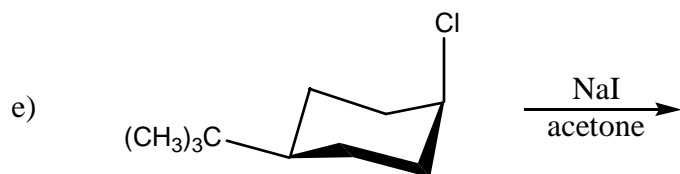
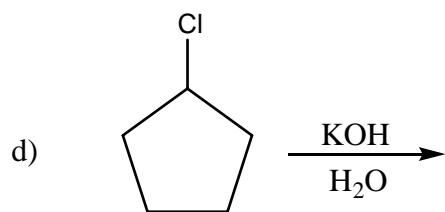


4. In each of the following pairs, circle the compound which is most reactive in an S_N2 reaction:



5. Complete the following reactions by providing either the major product or the missing reagents:





6. Using the curved – arrow formalism to show electron movement, provide a detailed (step – by –step) mechanism for the reaction below:

