

Francis Daniel Omokeoghelo

DEPT: Medicine and Surgery MATRIC NO: 19044801/177

CHEM 102 ASSIGNMENT

(1) Alcohols can be classified based on;

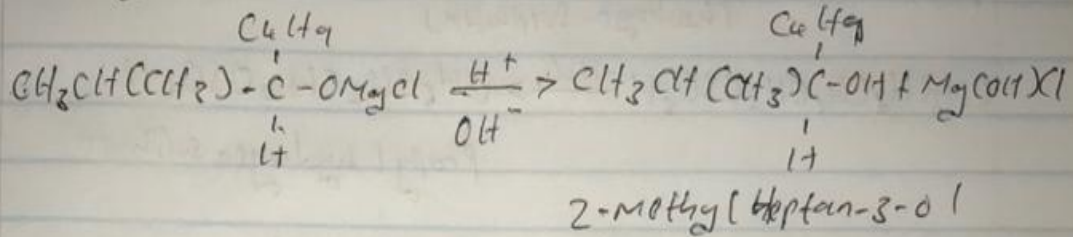
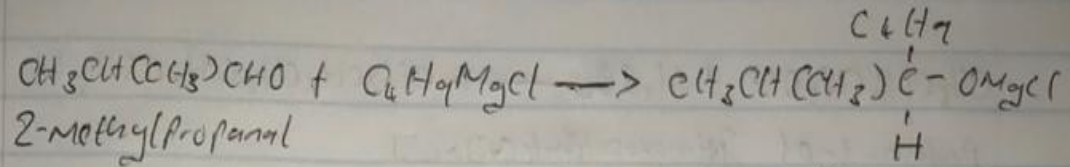
(i) The number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. If the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called a primary alcohol^(1°), if the number is one, it is called a secondary alcohol^(2°), if it has no hydrogen atoms attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol^(3°). An examples are $\text{C}_2\text{H}_5\text{OH}$ (Ethanol^(1°)), $\text{C}_3\text{H}_7\text{OH}$ (Propan-2-ol^(2°)) and $(\text{C}_2\text{H}_5)_2\text{C}-\text{OH}$ (Methylpropan-2-ol^(3°)).

(ii) The number of hydroxyl groups they possess. If the alcohol structure possesses one hydroxyl group, it is a monohydric alcohol. If it possesses two, it is called a dihydric alcohol or glycol. If it possesses three, it is called a trihydric alcohol or triol and if it possesses more than three hydroxyl groups, it is a polyhydric alcohol. Examples are; $\text{C}_3\text{H}_7\text{OH}$ Propanol (Monohydric) $\text{HOCH}_2\text{CH}_2\text{OH}$ Ethane-1,2-diol (Dihydric) and $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ Propano-1,2,3-triol (Trihydric)

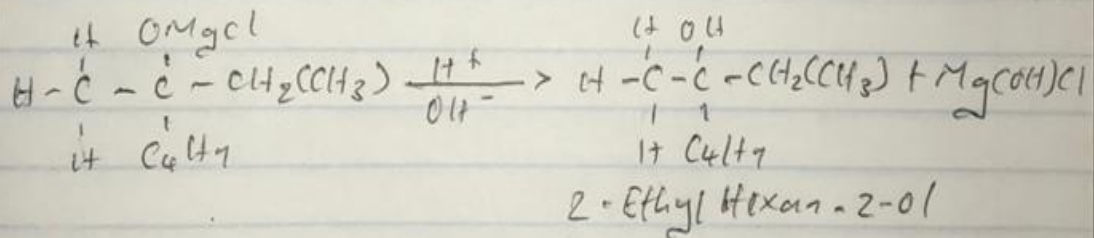
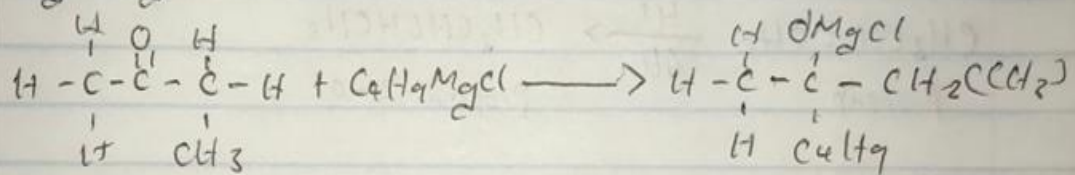
(2) Discuss the solubility of alcohols in water, organic solvents.

The water solubility of alcohols decreases with increasing relative molecular mass. Lower alcohols with up to three carbon atoms in the molecule are soluble in water because they can form hydrogen bonds with water molecules. The solubility of simple alcohols and polyhydric alcohols is also largely due to their ability to form hydrogen bonds with water molecules. All monohydric alcohols are soluble in organic solvents.

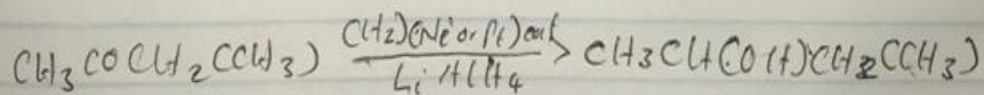
(4) Show the reaction between 2-methylpropanal and butylmagnesium chloride



(5) Show the reaction between methylpropanone and butylmagnesium chloride.



(6) Show the reduction reaction of methylpropanone



(7) Show the reduction reaction of 2-methylpropanal

