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1) Alcohols can be classified into two based on the following
a) 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 a primary alcohol, if it's one it is secondary and if there's none then it is Tetiary eg ethanol CH_3CH_2OH

b) This is based on the number of hydroxyl groups they posess. Monohydric alcohols have only one hydroxyl group, dihydric have two they are also known as glycols, trihydric alcohols or triols have three hydroxyl group and polyhydric alcohols have more than three hydroxyl groups. Eg $HOCH_2CH_2OH$ ethan-1,2-diol

2) Alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules
In organic solvent, all monohydric alcohols are soluble in organic solvent. Generally the solubility is due to their ability to form hydrogen bonds with water molecules.

3) ~~$2(C_6H_{10}O_5)_n$~~

$$2(C_6H_{10}O_5)_n + nH_2O \longrightarrow nC_{12}H_{22}O_{11}$$
Carbohydrate — 60°C/diatase — maltose

$$C_{12}H_{22}O_{11} + H_2O \longrightarrow 2C_6H_{12}O_6$$
maltose — 15°C/maltase — glucose

$$C_{12}H_{12}O_6 \longrightarrow 2CH_3CH_2OH + 2CO_2$$
Glucose — 15°C/zymase — ethanol

6) $CH_3CH_2CH_2CH_2MgCl + (CH_3)_2CH-\underset{H}{\overset{}{C}}=O \longrightarrow CH_3CH_2CH_2CH_2-\underset{H}{\overset{CH(CH_3)_2}{C}}-OMgCl$

$\xrightarrow{H^+OH^-} CH_3CH_2CH_2CH_2-\underset{H}{\overset{CH(CH_3)_2}{C}}-OH + MgCl$

7) $CH_3-\underset{CH_3}{CH}-\overset{O+H}{\overset{\|}{C}} + 2[H] \Rightarrow CH_3-\underset{CH_3}{CH}-\underset{OH}{CH_2}$

8) $CH_3CH_2CHOH + H_2SO_4 \longrightarrow CH_3CH + H_2O \longrightarrow CH_3CH=CHCH_3$