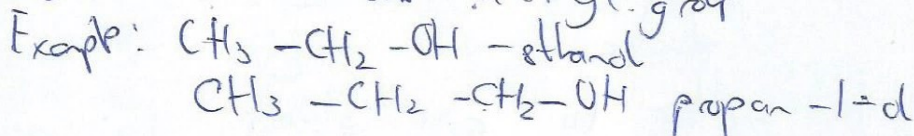


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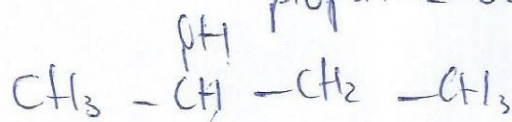
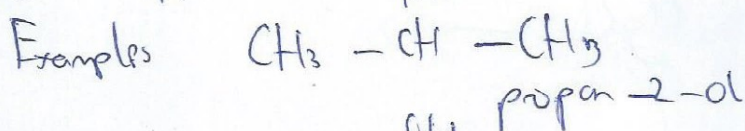
1 Classification of alcohols

i Primary: The carbon atom that carries the $-OH$ group is only attached to one alkyl group



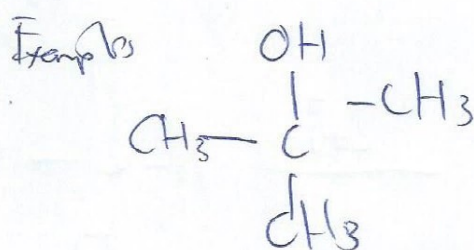
ii Secondary alcohol

In a secondary alcohol, the carbon atom with the $-OH$ group attached is joined directly to two alkyl groups, it may be the same or different

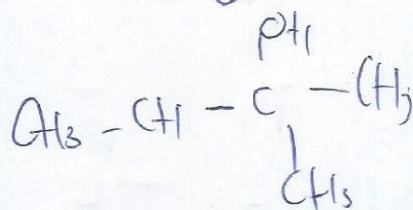


iii tertiary alcohol

In a tertiary (3°) alcohol, the carbon atom holding the $-OH$ group is attached directly to 3 alkyl groups



2-methyl propan-2-ol

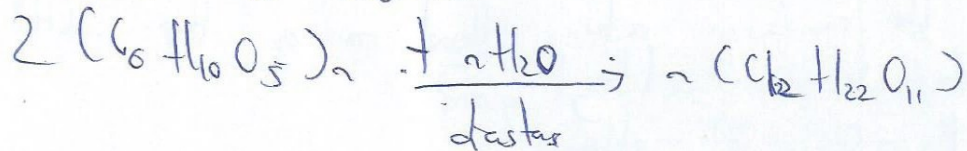


2-methyl butan-2-ol

2 Alcohols are soluble in water due to the hydroxyl group in the alcohol which is able to form hydrogen bonds with water molecules while the non-polar, alkyl group prevents alcohols to interact with non-polar organic molecules

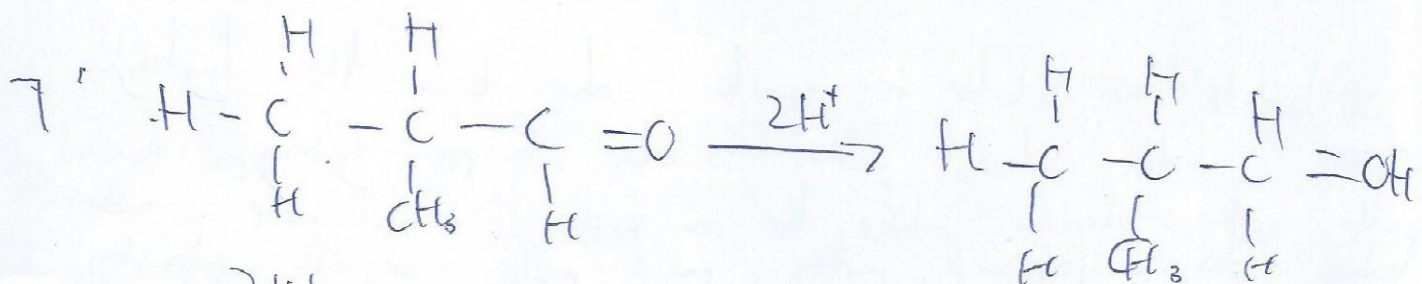
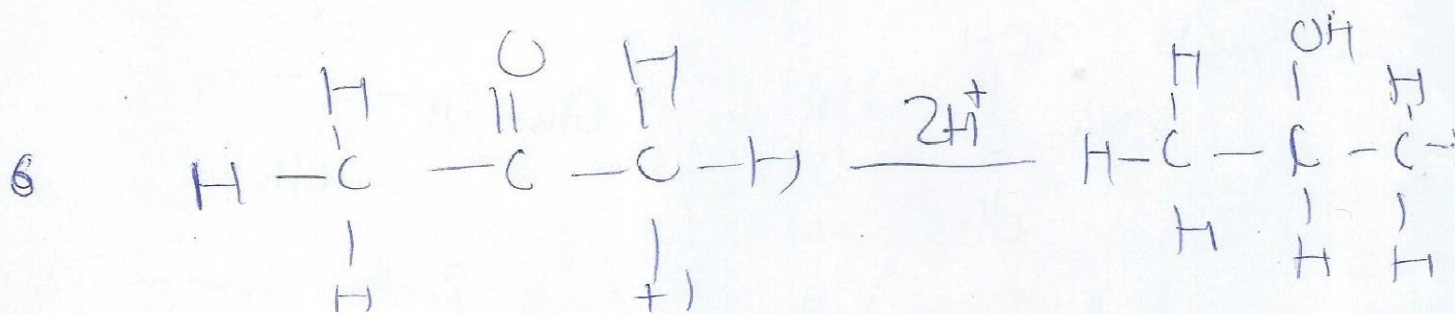
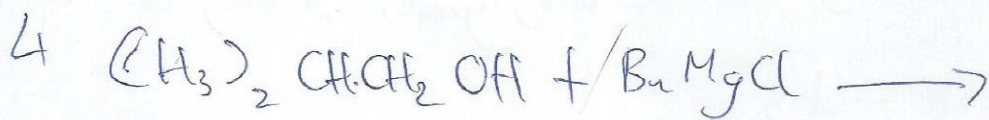
3. Ethanol can be manufactured from starch by the process of fermentation.

i. the starch is treated with malt and enzyme diastase convert starch to maltose



yeast is added to maltose to give glucose

Zymase in yeast convert glucose to ethanol and CO_2



$2H^+$ is added because such as LiAlH₄ because a substance when alcohol is reduced using agents occurs when hydrogen is added to

The Science for converting propanal to 1-propanol by propen-2-ol is isomerism

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$$\begin{aligned} 1 \quad y &= \sin\left(\frac{6}{5x^2}\right) \\ &= \sin(6x^{-2}) \\ &= \sin(6(x+Ax)^{-2}) \\ \Delta y &= \sin(6(x+Ax)^{-2}) - \sin(6x^{-2}) \\ &= 2 \cdot \cos\left(\frac{6}{2(x+Ax)}\right) \cdot \sin \end{aligned}$$

$$2 \quad x = 4t^3 - t^2 \\ \text{and } t = 3$$

$$A = \int_1^3 y dx$$

$$\text{given } y = t^4 + 2t^2$$

$$A = \int_1^3 t^4 + 2t^2 dx$$

$$\text{given } x = 4t^3 - t^2$$

$$\frac{dx}{dt} = 12t^2 - 2t$$

$$dx = (12t^2 - 2t) dt$$

$$A = \int_1^3 t^4 (12t^2 - 2t) dt$$

$$= \int_1^3 (12t^6 - 2t^5 + 24t^4 - 4t^3) dt$$

$$\left[12t^6 - 2t^5 + 24t^4 - 4t^3 \right]_1^3$$

$$[12(3)^6 - 2(3)^5 + 24(3)^4 - 4(3)^3] - [12 - 2 + 24 + 4]$$

$$10,098 - 30$$

10068 square units

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$$3 \quad x = 4t^3 - t^2 \quad y = t^4 + 2t^2$$

$$\frac{dx}{dt} = 12t^2 - 2t \quad \frac{dy}{dt} = 4t^3 + 4t$$

$$\frac{dy}{dt} \times \frac{dt}{dx} = \frac{4t^3 + 4t}{12t^2 - 2t}$$