Beckfoot

Subject: Chemistry	Topic: Alcohols	Year Group: 12

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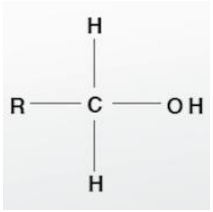
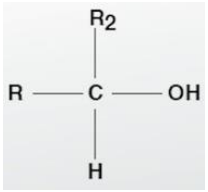
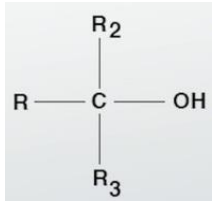
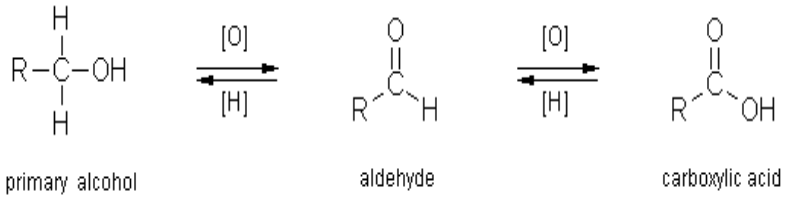
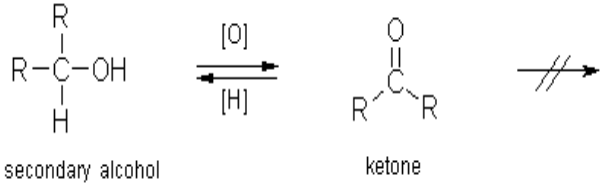
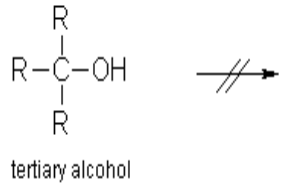
Classification

1	**Primary**	
2	**Secondary**	
3	**Tertiary**	

Oxidation of Alcohols

	Alcohol	Oxidation Conditions	Oxidation Product
1	Primary	Heat with acidified potassium dichromate(VI) solution. To further oxidise use excess oxidising agent and heat under reflux.	Oxidised to an aldehyde, can be further oxidised to a carboxylic acid.
2	Secondary	Heat under reflux with acidified potassium dichromate(VI) solution.	Ketone.
3	Tertiary	Not easily oxidised.	Not oxidised.

Oxidation Equations

1	
2	
3	

Distinguishing Between Aldehydes and Ketones

	Test	Test Procedure	Observation with an Aldehyde	Observation with a Ketone
1	**Fehling's Test**	Warm with Fehling's reagent	Brick-red precipitate forms	No change
2	**Tollens' Test**	Warm with Tollens's reagent.	Silver mirror forms on the side of the test tube	No change

Key Vocabulary

1	Biofuel	A fuel that's made from biological material that has recently died.
2	Carbon Neutral	Results in no net release of carbon dioxide.
3	Reflux	Heating a reaction while continually cooling the vapour produced back into liquid form using a condenser.

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Industrial Production of Ethanol

Method		Hydration of Ethene	Fermentation of Glucose
1	**Equation**	$CH_2=CH_2$ (g) + H_2O (g) → CH_3CH_2OH (g)	$C_6H_{12}O_6$ (aq) → $2C_2H_5OH$ (aq) + $2CO_2$ (g)
2	**Conditions**	300°, 60 atm pressure, solid phosphoric acid catalyst	30-40°C, yeast, anaerobic conditions
3	**Rate of Reaction**	Very fast	Very slow
4	**Quality of Product**	Pure	Very impure- needs further processing
5	**Raw Material**	Ethene from oil	Sugars
6	**Process/Costs**	Continuous process, so expensive equipment needed, but low labour costs	Batch process, so cheap equipment needed, but high labour costs

Hydration of Ethene Mechanism