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Department: Public Health

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Assignment

1. They can be classified as primary, secondary or tertiary depending on the location of the OH (hydroxyl or hydroxy) functional group. For instance (°) is used to refer to primary, secondary and tertiary alkanols: primary alkanol = 1° -OH on a terminal (end of chain) C atom, secondary alkanol = 2° alkanol - OH on a C atom bonded to 2 C atoms., tertiary alkanol = 3° alkanol - OH on a C atom bonded to 3 C atoms.

2. $R'R''C=O + RMgX \rightarrow R'R''C(O^-)Mg^+X^+$

$R'R''C=O + Mg(OH)X$

$CH_3CH_2CH_2CH_2C(=O)CH_2CH_2CH_3 + CH_3MgCl$

$CH_3CH_2CH_2CH_2C(OMg)CH_2CH_2CH_3$

$CH_3CH_2CH_2CH_2C(OH)CH_2CH_2CH_3 + MgCl$

Grignard Synthesis

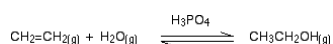
$CH_3CH_2CH_2CH_2C(=O)CH_2CH_2CH_3 + CH_3MgCl$

$CH_3CH_2CH_2CH_2C(OMg)CH_2CH_2CH_3 \rightarrow CH_3CH_2CH_2CH_2C(OH)CH_2CH_2CH_3 + MgCl$

Compound Reagent = CH_3MgCl

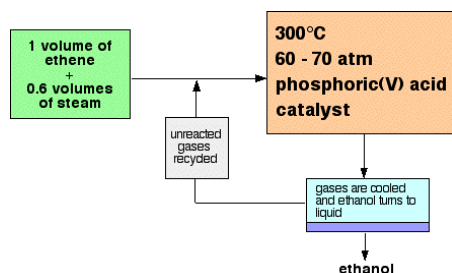
Methyl Magnesiumchlorite

3. Ethanol is manufactured by reacting ethene with steam. The catalyst used is solid silicon dioxide coated with phosphoric(V) acid. The reaction is reversible.



Only 5% of the ethene is converted into ethanol at each pass through the reactor. By removing the ethanol from the equilibrium mixture and recycling the ethene, it is possible to achieve an overall 95% conversion.

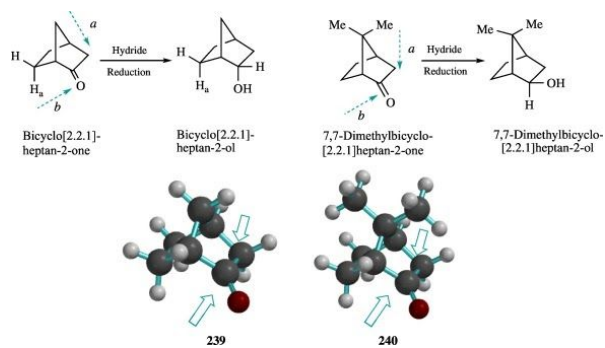
A flow scheme for the reaction looks like this:



4. Reduction (addition of hydrogen using a reducing agent):

(a) Alkanones can be reduced to secondary alkanols.

Example:heptan-2-one



(b) Alkanals can be reduced to primary alkanols.

Example:hexanal

