and ethanoic acid is formed

$(CH_3CO)2O + CH_3CH_2OH \rightarrow CH_3COOCH_2CH_3 + CH_3COOH$

The reaction with phenol is similar, but will be slower phenyl ethanoate is formed together with ethanoic acid.

If the phenol is first converted into sodium phenoxide by adding sodium hydroxide solution the reaction is faster. phenyl ethanoate is formed but the time is formed the other product is sodium ethanoate rather than ethanoic acid.

35) Making esters from carbolyxic acids

This method can be used for converting alcohols into esters, but it doesnt work with phenols - ~~compounds~~ compounds where the -OH group is attached directly to a benzene ring phenols react with carboxylic acids so slowly that the reaction is unusable for preparation purposes

Esters are produced when carboxylic acid are treated with alcohols in the presence

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1a) Methoxymethane
b) Ethoxyethane
c) pentanamide
d) methoxyehane
e) Ethoxypropane

2a) Physical properties of ethers

i The miscibility of ethers with water resembles those of alchothols
ii) Ether molecules are miscible in water
iii) An ether molecule has a net dipole moment due to the polarity of C-O bonds
iv) Boiling point of ethers is comparable to the alkanes

2b) Chemical properties of ethers
i) Doesnt react with bases, active metals, oxidizing agents and reducing agents
ii) Strong acids will cleave esters at elevated temperatures

of an acid catalyst. The catalyst is usually concentrated sulphuric acid. Dry hydrogen chloride gas is used in some cases, but these tend to involve aromatic esters (ones where the carboxylic acid contains a benzene ring). The esterification reaction is both ~~slow~~ slow and reversible

iii) when stored in presence of oxygen they form explosive peroxides such as diethyl ether peroxide

ii) Sterilization of medical equipments
ii) Production of other chemicals used to manufacture products such as clothes, fabric et.c
iii) Ethylene glycol which is derived from ethylene oxide is used to manufacture fiberglass

3a) Making esters with acid anhydrides
This reaction can again be used to make esters from both alcohols and phenols. The reactions are slower than the corresponding reactions with acyclic chlorides, and you usually need to warm the mixture. In the case of a phenol, you can react the phenol with sodium hydroxide solution first, producing the more reactive phenoxide ion.

Taking ethanol reacting with ethanoic anhydride as a typical reaction involving an alcohol. There is a slow reaction at room temperature (or faster on warming). There is no visible change in the colorless liquids, but a mixture of ethyl ethanoate rather