ARENES: FRIEDEL-CRAFTS REACTIONS

1. a) \( \text{R-} \text{C} = \text{O} \) where \( \text{R} \) is a hydrocarbon group.

b) Ethanoylation is a specific example of acylation where the acyl group is an ethanoyl group:

\[ \text{CH}_3\text{C} = \text{O} \]

c) React benzene with propanoyl chloride in the presence of aluminium chloride as a catalyst at about 60°C for about 30 minutes.

d) \( \text{CH}_3 \)

\( \text{COCH}_3 \)

e) hydrogen chloride

2. a) React benzene with chloroethane in the presence of aluminium chloride as a catalyst at room temperature.

b) Substituting an alkyl group into the benzene ring makes the ring more reactive than it is in the original benzene, and so further alkyl groups get substituted as well.

c) \( \text{CH}_3 \)

\( \text{CH}_3 \)