

Chemguide – questions

ARENES: FRIEDEL-CRAFTS REACTIONS

1. Friedel-Crafts acylation involves replacing a hydrogen on a benzene ring by an acyl group.
 - a) What is an acyl group?
 - b) We quite often talk about ethanoylation rather than acylation. What is the difference between the two terms?
 - c) Name the reactants, and give the conditions, for the formation of the compound $C_6H_5COCH_2CH_3$ using Friedel-Crafts acylation.
 - d) Draw the structure of the major organic product of the reaction between methylbenzene and ethanoyl chloride.
 - e) What non-organic product is also formed in this reaction?
2.
 - a) How would you convert benzene into ethylbenzene using Friedel-Crafts alkylation?
 - b) Suggest why you get multiple substitution of alkyl groups into a benzene ring when using Friedel-Crafts alkylation.
 - c) An alkyl group on a benzene ring usually directs incoming groups into the 2- and 4- positions, but for complex reasons, if you do a Friedel-Crafts alkylation with methylbenzene and chloromethane at room temperature, the main product tends to be 1,3-dimethylbenzene. Draw its structure.