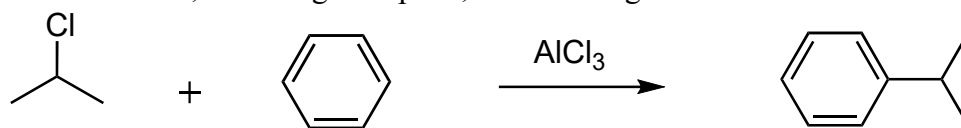


4A) (10 pts) Provide a complete mechanism for the following electrophilic aromatic substitution reaction. Pay close attention to details, including lone pairs, formal charges and the use of curved arrows.



4B) (8 pts) The above Friedel-Crafts alkylation reaction often gives side products resulting from multiple substitutions, such as **A**. The Friedel-Crafts *acylation* reaction does not have the same problem (the benzene ring only reacts once). Explain why these two reactions would behave differently, and **provide 1 or 2 simple drawings to support your answer**.

