UF | UNIVERSITY of FLORIDA

Pre-Health Post-Baccalaureate Program
CHM2211 Study Guide & Practice Problems

Date:

10/12 – 10/16

Topics Covered:

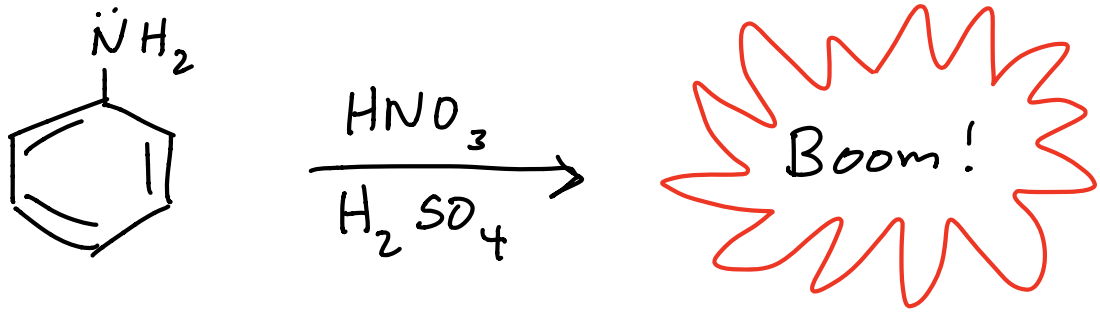
The "Final Act" of EAS

Created by Isaac Loy

So ... we want to make p-Nitroaniline from Aniline via EAS

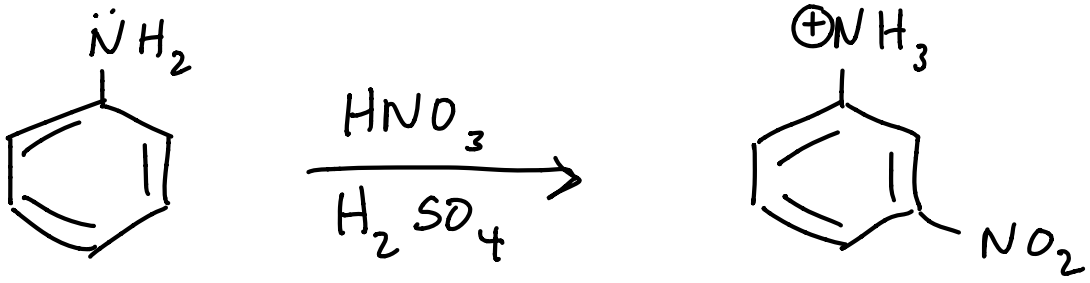
- We have a problem, however: following the EAS nitration pathway, two things can happen and both are unfavorable:

Unfavorable option #1



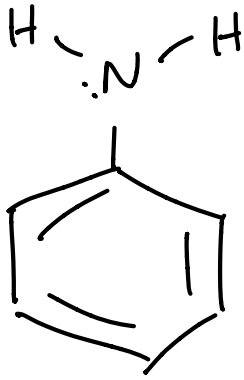
This happens because we add an electron withdrawing group ($-NO_2$) para to an electron donating group ($-NH_2$). The explosion happens because of the molecule's instability.

Unfavorable option #2

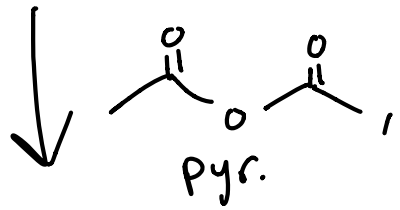


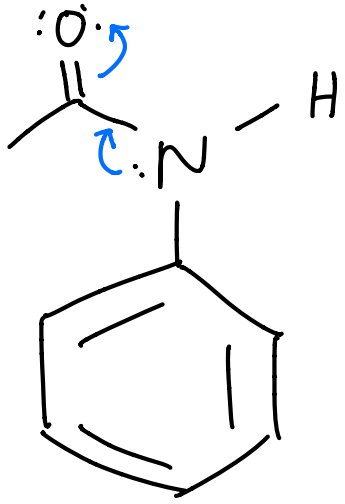
Recall your rules: proton transfer is #1 (that is - if it can happen it will happen). The acidic nitration conditions protonate the amine which means it can no longer function as a lone pair activator to EAS. The resulting product is m-Nitroaniline, NOT p-Nitroaniline.

— Let's create a synthesis pathway to make our target material (T. M.), p-Nitroaniline, from Aniline

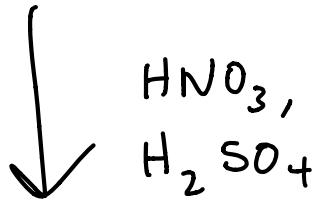


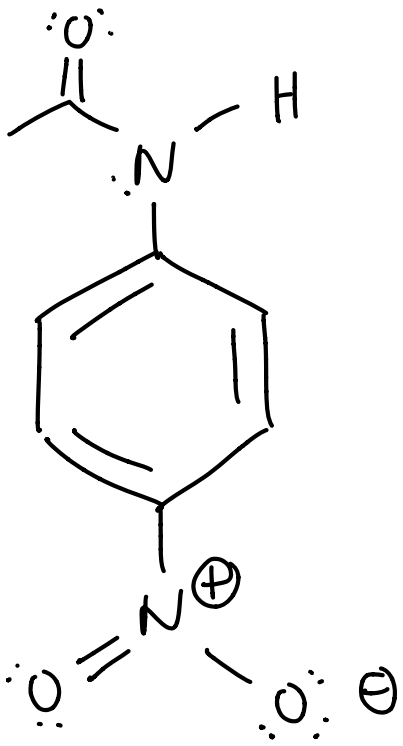
Newly-formed amide is super stable (see staircase) because LP is dedicated to resonance

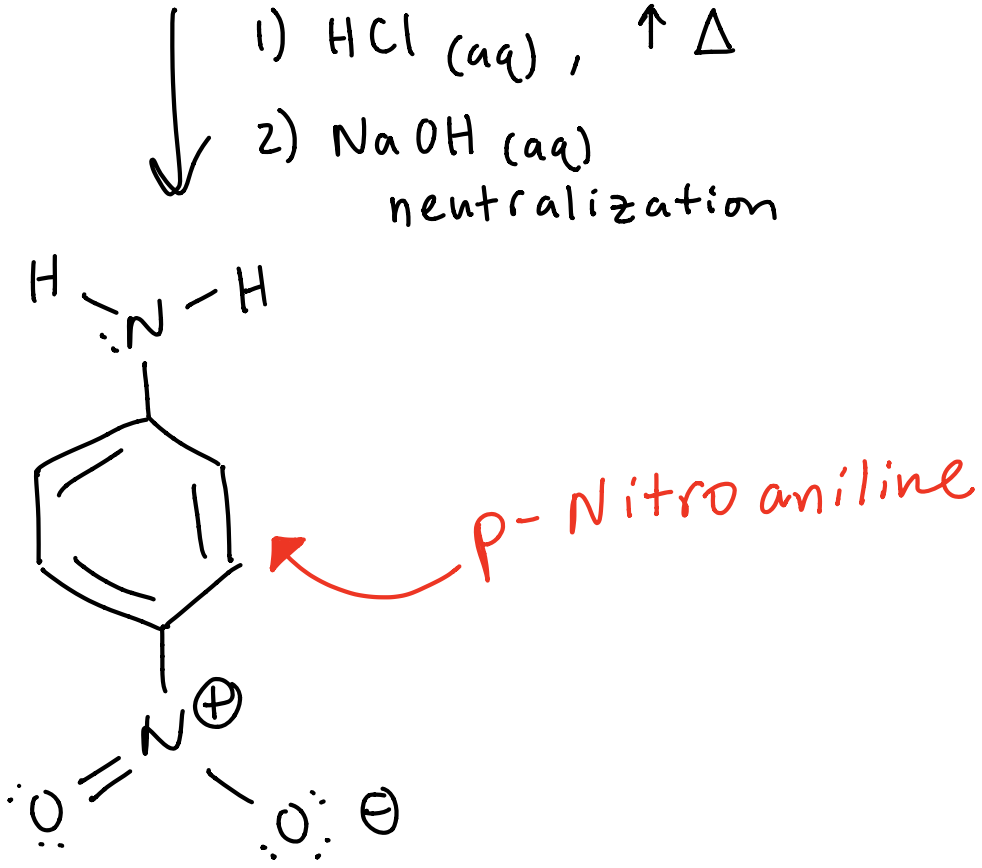




Because of newly-found stability, we can now proceed with EAS without the threat of explosion







NOTE: make sure to understand the chemistry behind this reaction very well — knowing the mechanism wouldn't hurt, either