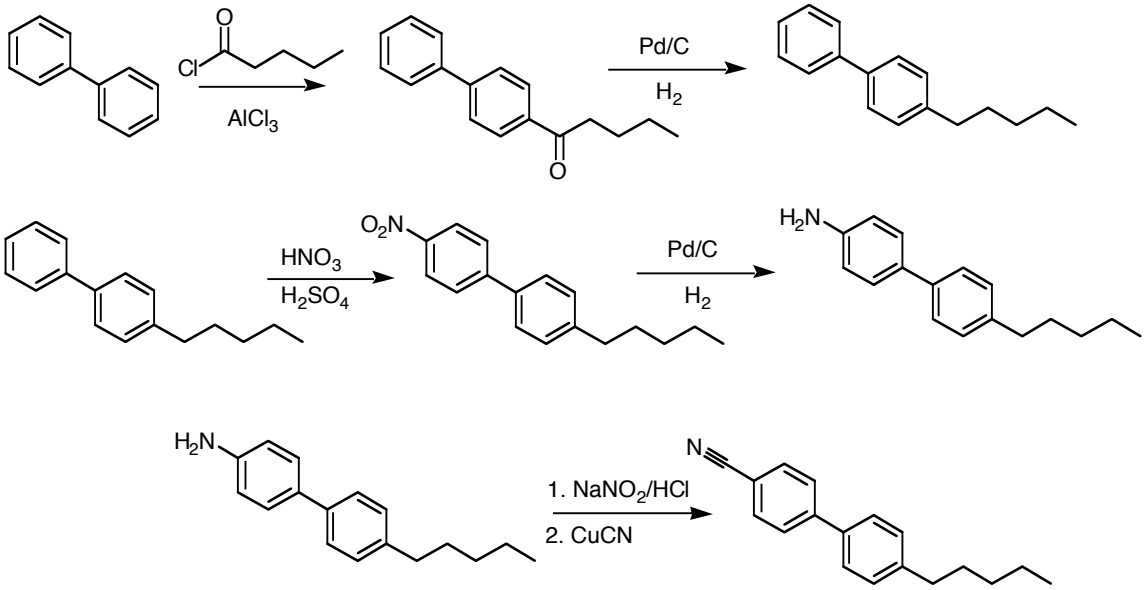
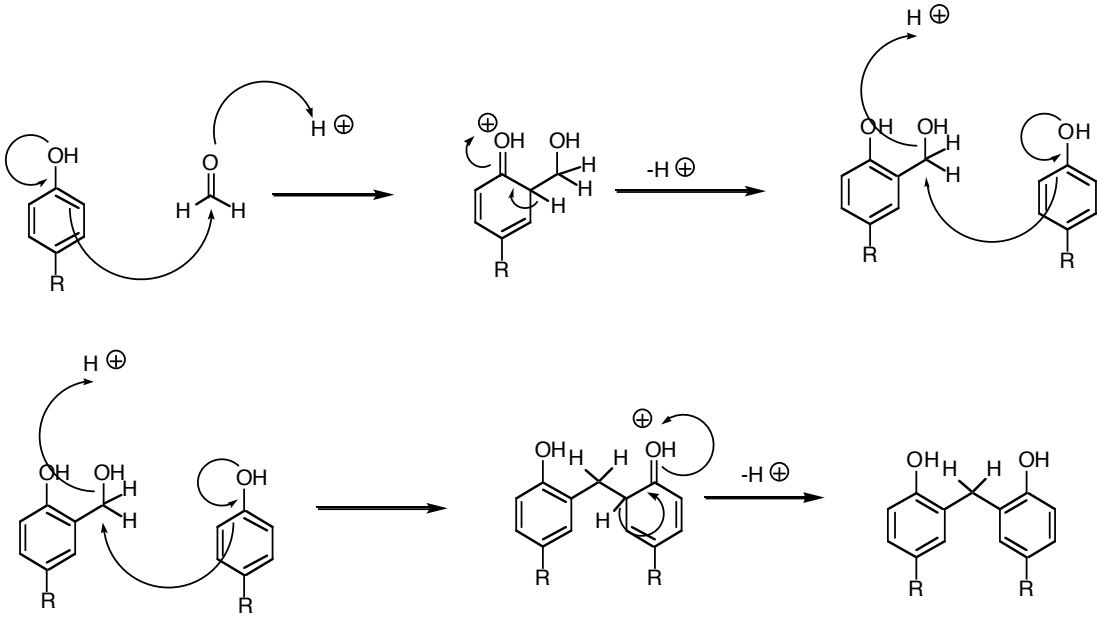
Problem Set #2 Answer Key

1.

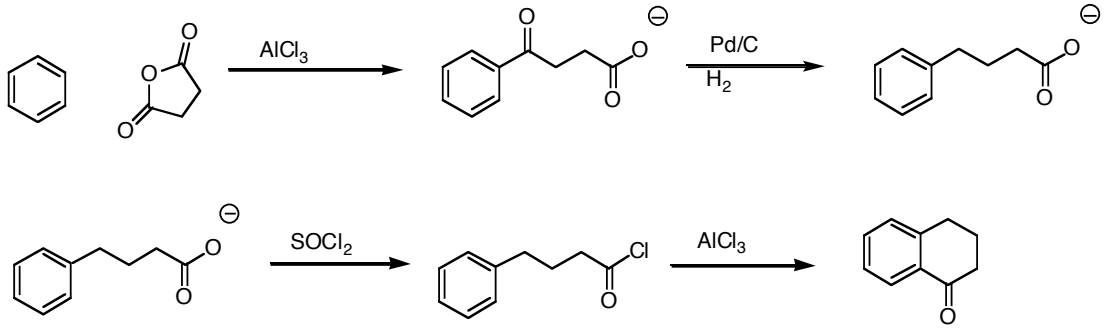


2. (a)-

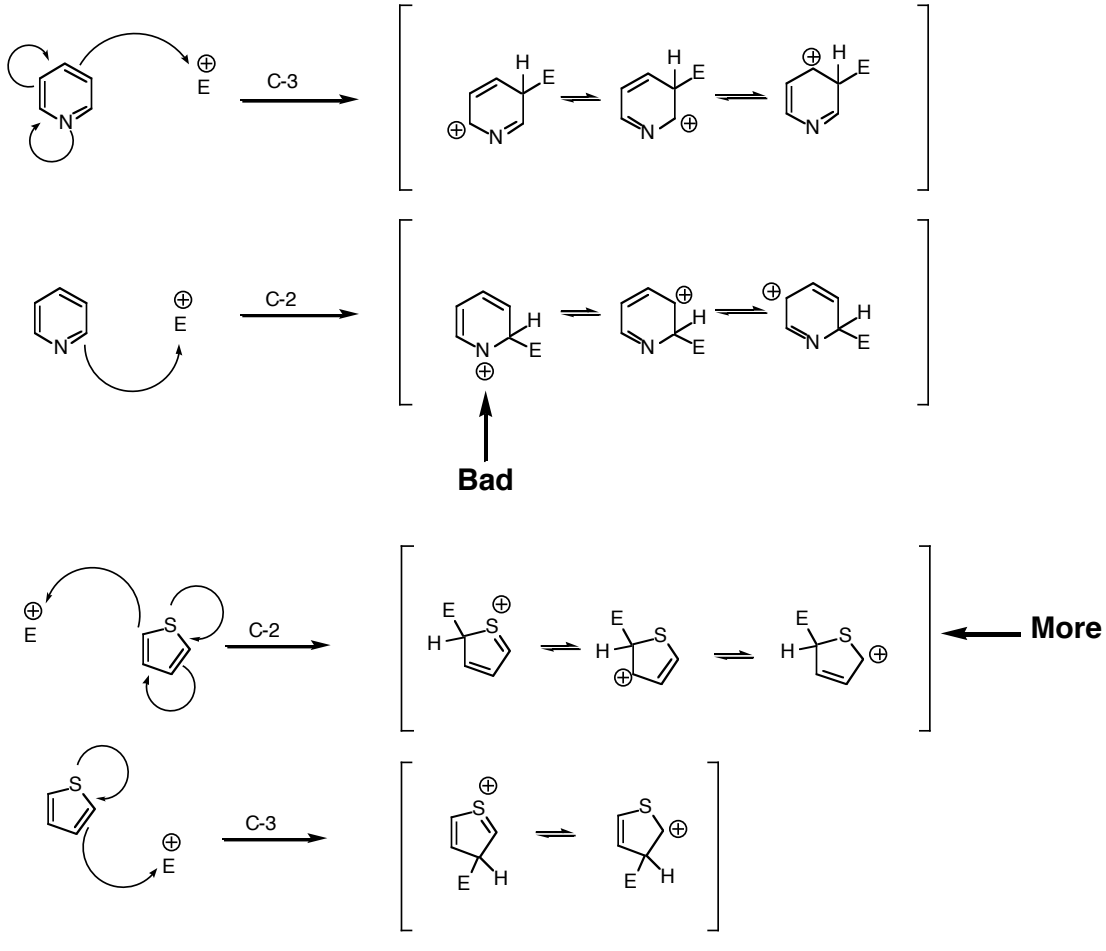


(b)- Phenols are very activated for electrophile aromatic substitution, thus are good substrates for the polymerization.

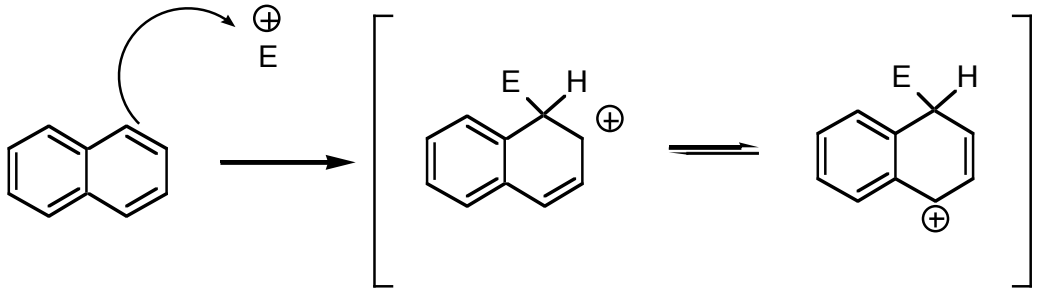
3.

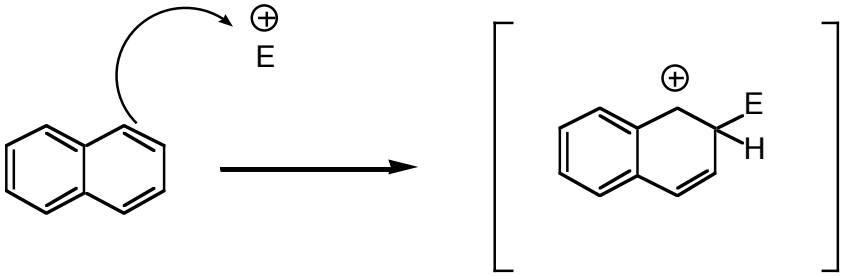


4. For Pyridine systems C-3 attack is favored due to the "bad" reasonance structure present in C-2 attack. For Thiophene systems C-2 attack is favored due to the number of different reasonance structures that can be drawn.

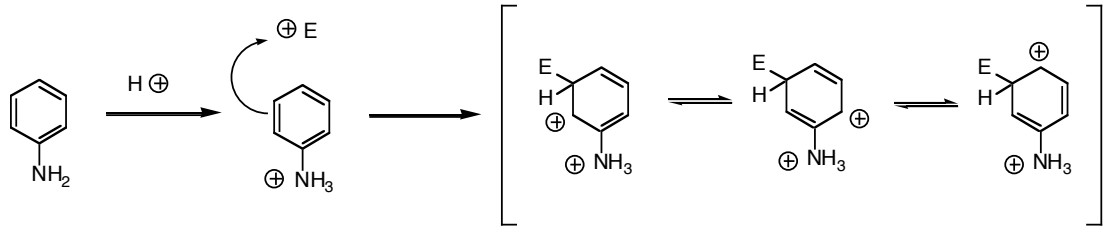


5. Bromination and Nitration occur at the 1 position to preserve reasonance stability (an allylic cation rearrangement), whereas Friedel-Crafts acylation occurs at the 2 position due to the relativly hindered 1 position (ie. the electrophile's gargantuan size).

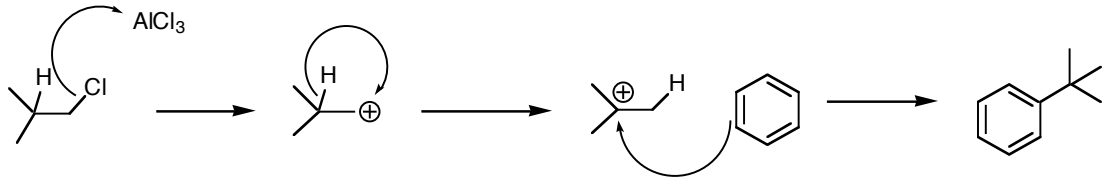


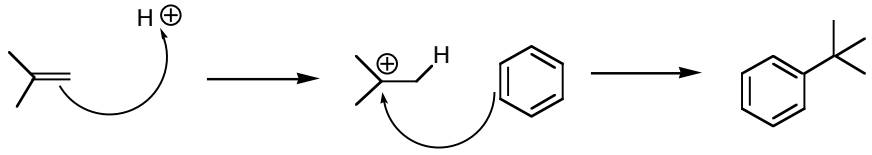


6. The acidic media protonates the aryl amine, thus turning it from an electron rich ortho-para director to a relativly electron deficient meta director.

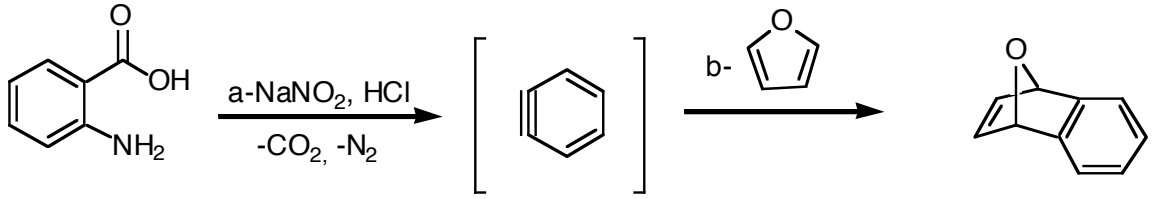


7.

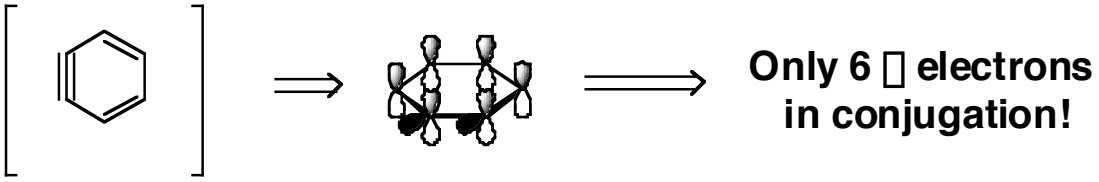




8.



9. Only six π electrons are in conjugation, the other two electrons are in the plane of the aromatic ring, orthogonal to the aromatic system.



10.