**Assignment #2 (Due Feb 3, 2023)**

**Chem 436 – Spring 2023**















Answer:  


This is a typical radical reaction. The goal is to have the most stable radical. Based on organic chemistry I, the radicals should be at the following positions.



The extra benzene rings in 1, 2, and 4 can help stabilize the radicals (see the resonance structures one the lecture notes). But the one in 3 cannot since it is not involved in the resonance structures. The methyl group makes 2 more stable than 1.



6. A reaction with *para*-chloronitrobenzene with sodium 2.6-di-*tert*-butylphenoxide was carried out with the purpose of synthesizing diphenyl ether (A). However, the product of the transformation was not A, instead, an isomer of A was formed. (Hint: the isomer of A contains a phenolic hydroxy group.)



Answer: A resonance structure for the 2.6-di-*tert*-butylphenoxide anion which shows the carbon para to oxygen is nucleophilic.



There is significant steric hindrance surrounding the oxygen atom due to the bulky tert-butyl; therefore, the para carbon is nucleophilic and an SNAr reaction occurs at that position to furnish the biphenyl product.





