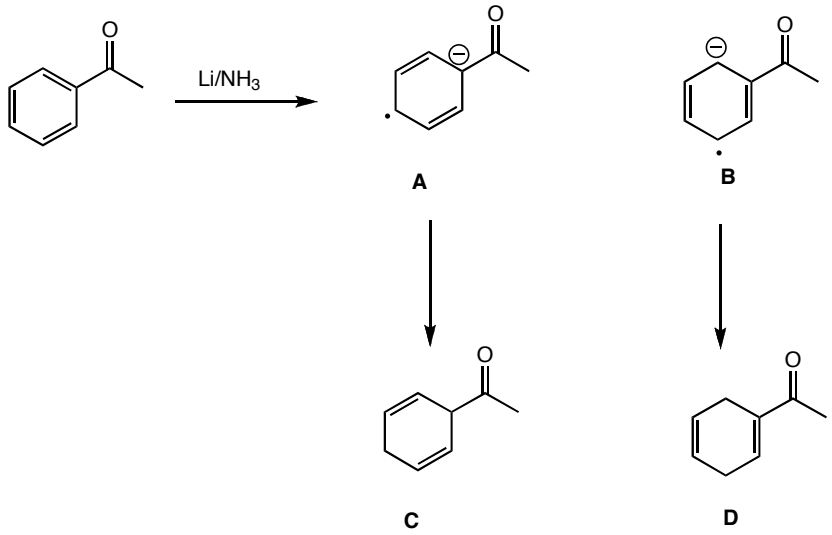
Chemistry 218, Problem Set 8

Recommended problems from the book: 20.25, 20.29-20.30, 20.34-20.35, 20.40 (l), 20.41, 20.43 (f), 20.48 (g, j), 20.50, 20.51, 20.52(c), 20.60 (except f), 20.61-20.66

(Recommended problems from 1st ed): 20.26, 20.29-20.31, 20.34, 20.39 (l), 20.40, 20.42 (f), 20.48 (g,j), 20.49, 20.50, 20.51 (c), 20.57, 20.58 (except h), 20.59-20.62

1. In a Birch reaction, an aromatic compound is treated with Li/NH_3 to give cyclohexadiene products (**C** and **D** below). One of the intermediates in the Birch reaction is a radical anion. In the example below, anisole could potentially form radical anion **A** or **B**, which go on to give **C** and **D** respectively.

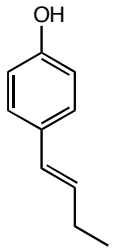


(a) Is the Birch reaction an oxidation or reduction?

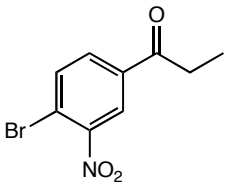
(b) Which anion is more stable, **A** or **B**? Why?

(c) <u>For the Birch reaction</u>, is a carbonyl group activating or deactivating?

2. Propose a synthesis with the following stipulations. There are also many excellent synthesis problems in the text.



from phenol and any acid chloride



from phenyl Grignard and any aldehyde

benzoic acid from benzene (you may not use 

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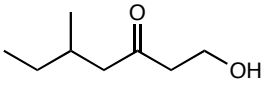
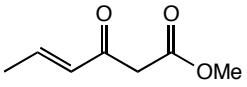


from



3. The ^{1}H NMR spectrum for vinyl acetate is shown below. Assign the peaks as best you can, and explain the observedcoupling patterns.