

Side Chain Reactions of Alkylbenzenes & Synthetic Applications

February 3, 2020

- Benzylic halogenation.
- Addition reactions with alkenylbenzenes.
- Side chain oxidations: all roads lead to benzoic acid.
- The Birch reduction.
- Synthetic applications.

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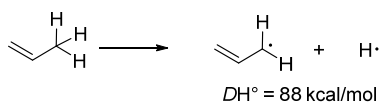
O'Leary office hours: T/Th 9:30-10:00 am, SN 208.

O'Leary's evening review session: Wednesdays 7:00 PM, SN Aud. **Course website:** <http://pages.pomona.edu/~djo04747/110/>

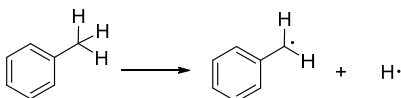
Suggested Problems for Exam 1. 10e/11e/Chapter 14: 18, 24, 26, 27, 28, 31, 33, 35. 10e/Chapter 15: 24, 25, 27, 28, 34abc, 43, 51. 11e/Chapter 15: 22, 23, 25, 26, 32abc, 41, 49.

Exceptionally Stable Radicals

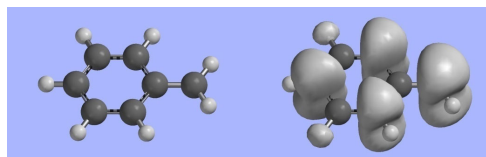
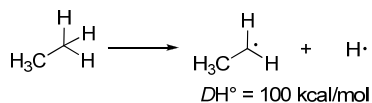
recall the stable allylic radical:



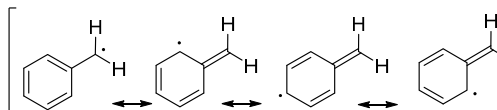
consider the stable benzylic radical:



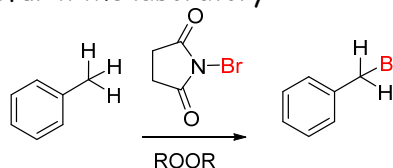
ethane as a reference compound:



spin density surface, benzylic radical



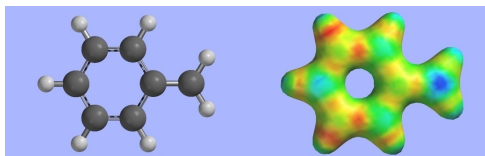
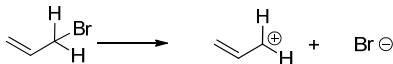
Useful in the laboratory:



NBS: see p. 589(10E) 476 (11E) for mechanism.

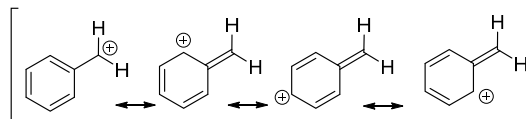
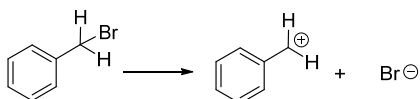
Exceptionally Stable Cations

recall the stable allylic cation:

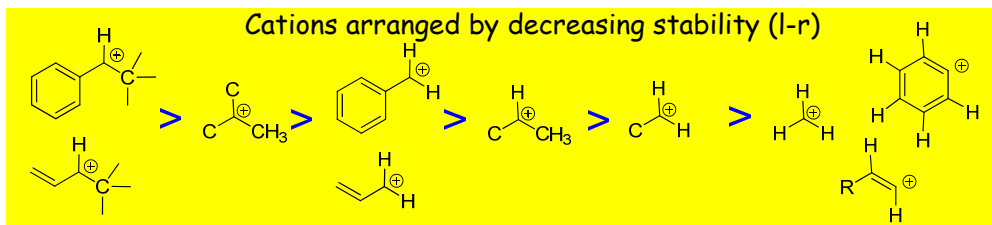


eps, benzylic cation

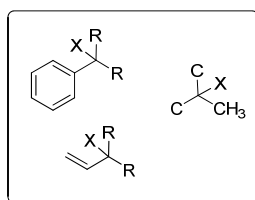
consider the stable benzylic cation:



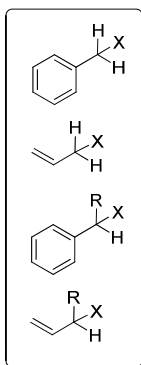
Cations arranged by decreasing stability (l-r)



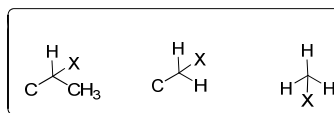
Benzylic & Allylic Halides: Visiting Some Old-School Pals



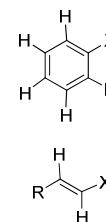
mainly S_N1



S_N1 or S_N2

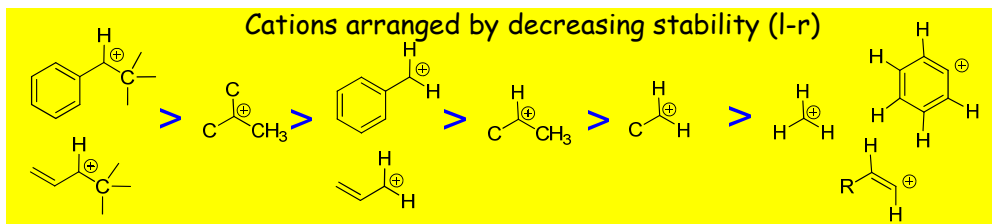


mainly S_N2

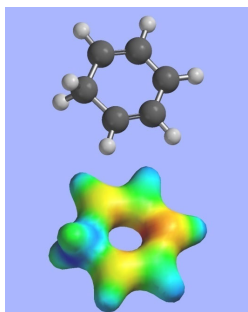


NR

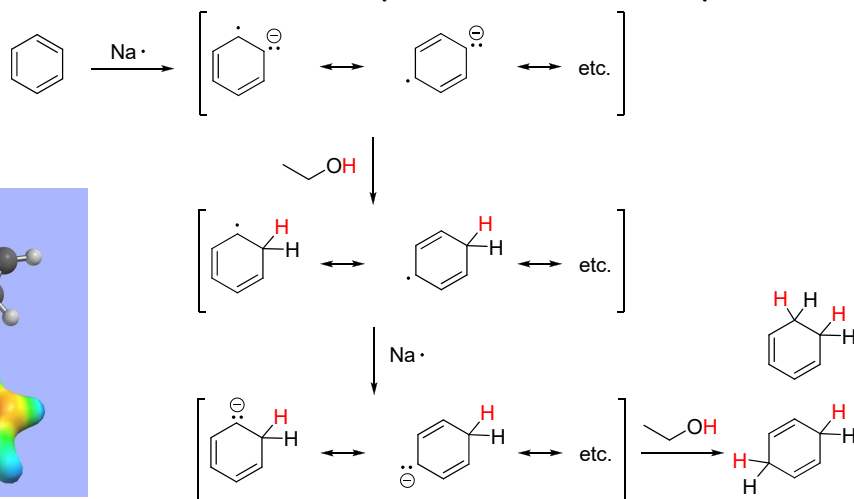
Cations arranged by decreasing stability (l-r)



The Birch Reduction: Synthesis of 1,4-cyclohexadienes



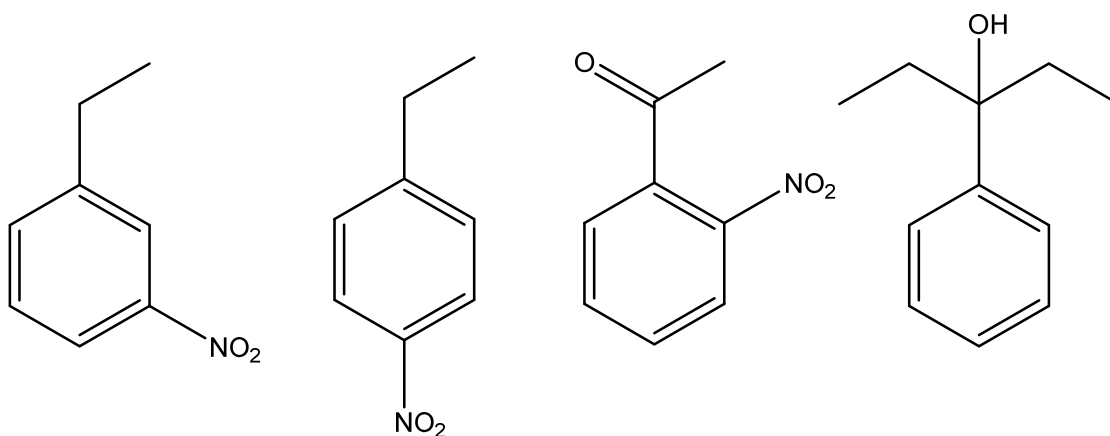
eps of the anion



recall:



Practice Syntheses



from benzene