Kekulē, would you please wake up!
January 22, 2020

- Course overview
- Benzene's special chemistry.
  - Chemical stability, resonance & MO picture.
  - Huckel's rule, Frost's Magic Circle, aromaticity.
  - A pinch of nomenclature.

110b Teaching Fellows: Felipe Becerril, Christina Beck, Isabelle Cheng, Junha Gu, Nathalie Hong, Shy Lavasani, Allison Liu, Casey Morrison, Jerusalem Nerayo, Eric Tang, Baili Zhong.

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

O'Leary's evening review session: Wednesday 1/24 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.

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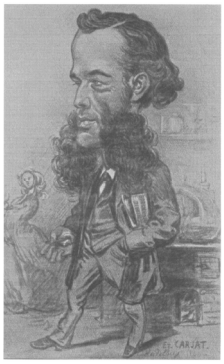
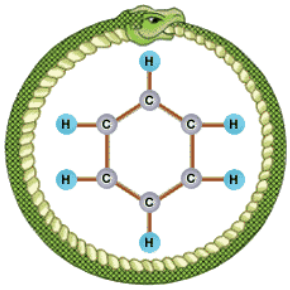


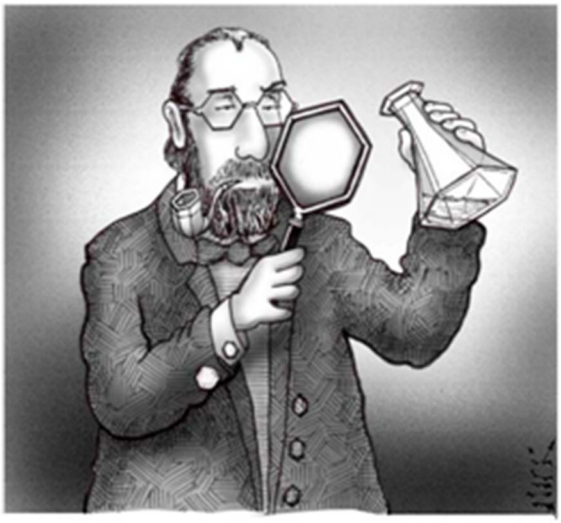
Friedrich August Kekulé
1829-1896



1865

.... "I was sitting writing on my textbook, but the work did not progress; my thoughts were elsewhere. I turned my chair to the fire and dozed. Again the atoms were gamboling before my eyes. This time the smaller groups kept modestly in the background. My mental eye, rendered more acute by the repeated visions of the kind, could now distinguish larger structures of manifold conformation; long rows sometimes more closely fitted together all twining and twisting in snake-like motion. But look! What was that? One of the snakes had seized hold of its own tail, and the form whirled mockingly before my eyes. As if by a flash of lightning I awoke; and this time also I spent the rest of the night in working out the consequences of the hypothesis".

Great events in Chemistry...

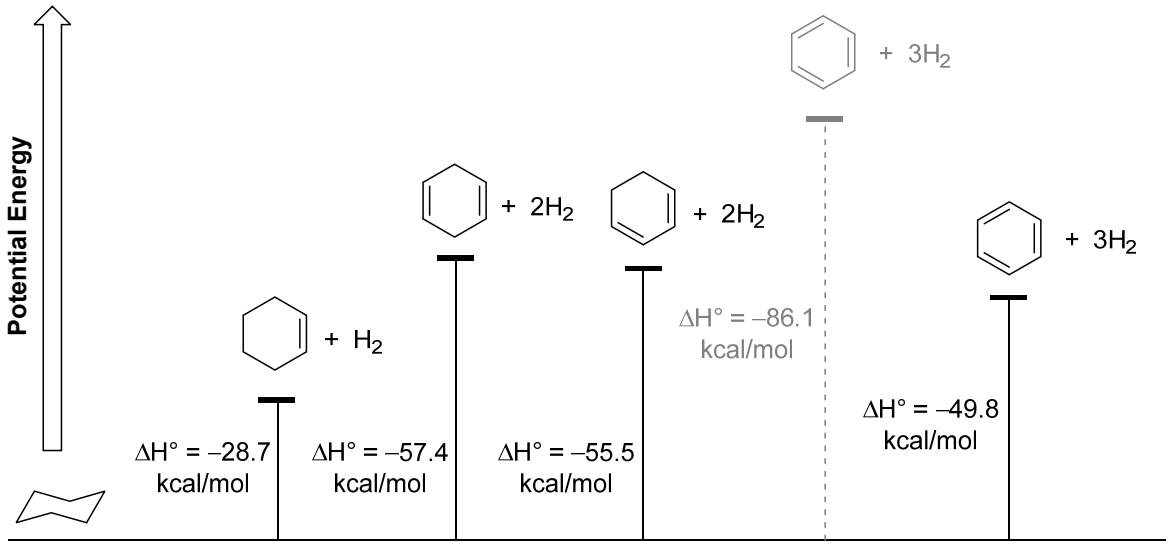


1865: Kekulé, moments before his brilliant insight into the structure of benzene.

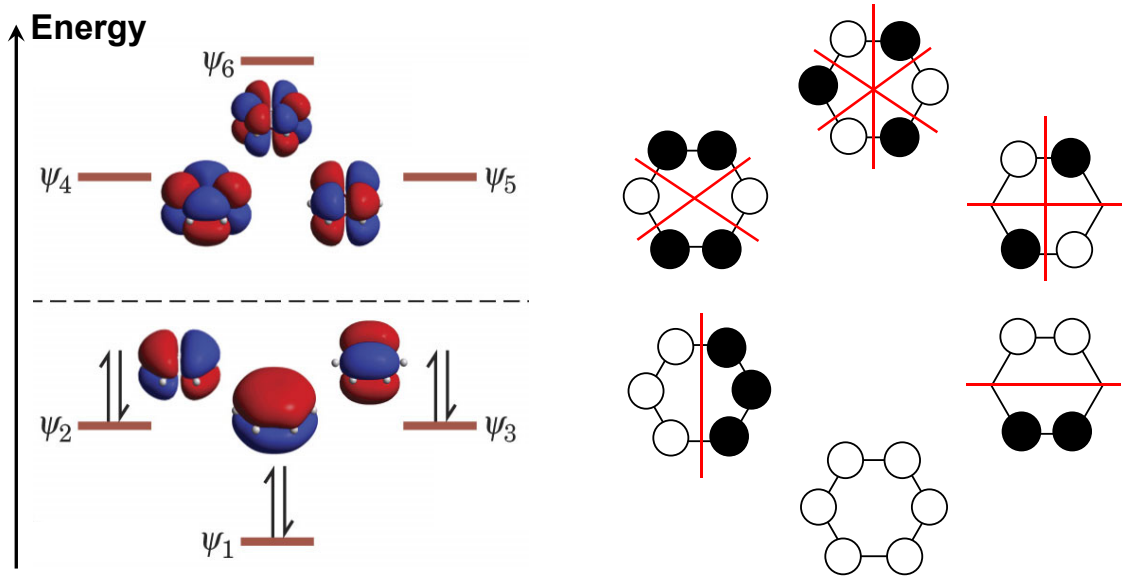
Kathleen Lonsdale establishes the cyclic structure of benzene by X-ray crystallography

The Structure of the Benzene Ring in Hexamethylbenzene," *Proceedings of the Royal Society* 123A: 494 (1929).

Experimental and Predicted Heats of Hydrogenation



Benzene MO's



Aromatic Compound (as defined in Solly's glossary)

A cyclic conjugated unsaturated molecule or ion that is stabilized by π-electron delocalization.

Aromatic compounds are characterized by having large resonance energies, by reacting by substitution rather than addition, and by deshielding of protons exterior to the ring in their ^1H NMR spectra caused by the presence of an induced ring current.

Nomenclature Examples