

Engaging Student Interest

What arose *our* interest in organic chemistry?

- Professor's passion
- Transforming substances
- 'Clicking' event

Engaging Student Interest

The 8-step method to engage student's interest:

- 1) Demonstrations

- 2) In the News

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3) Storytelling

HMAV Bounty



Cinchona

- 1817 Pelletier & Caventou
Isolation of Quinine $C_{20}H_{24}N_2O_2$



[http://www.rain-tree.com/
Plant-Images/quinine-pic.htm](http://www.rain-tree.com/Plant-Images/quinine-pic.htm)



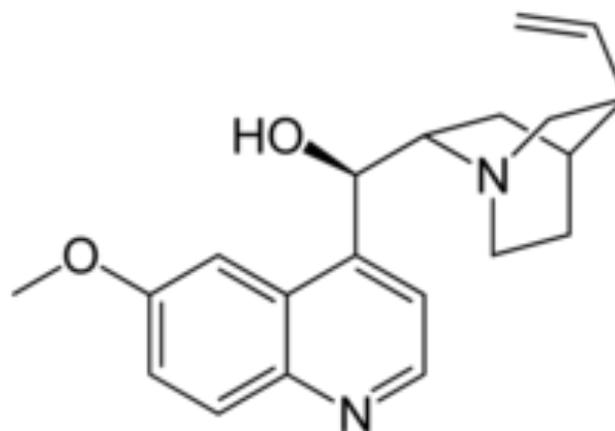
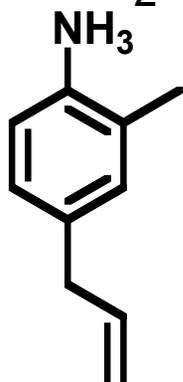
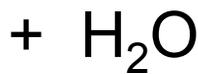
Synthesis of Quinine



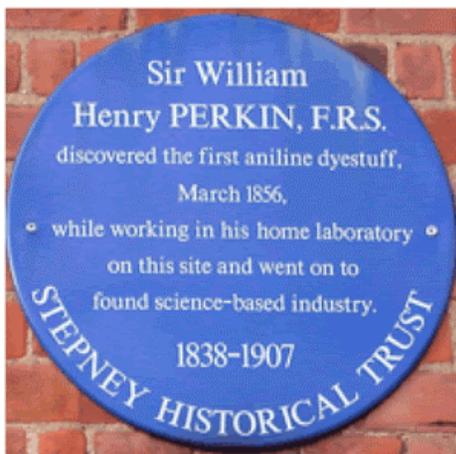
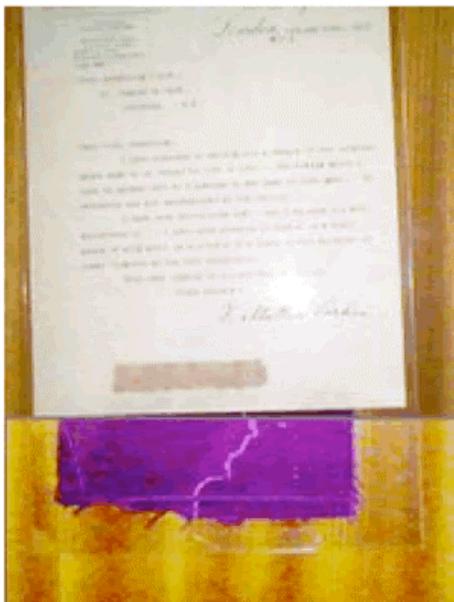
August Wilhelm von Hofmann



William Henry Perkin

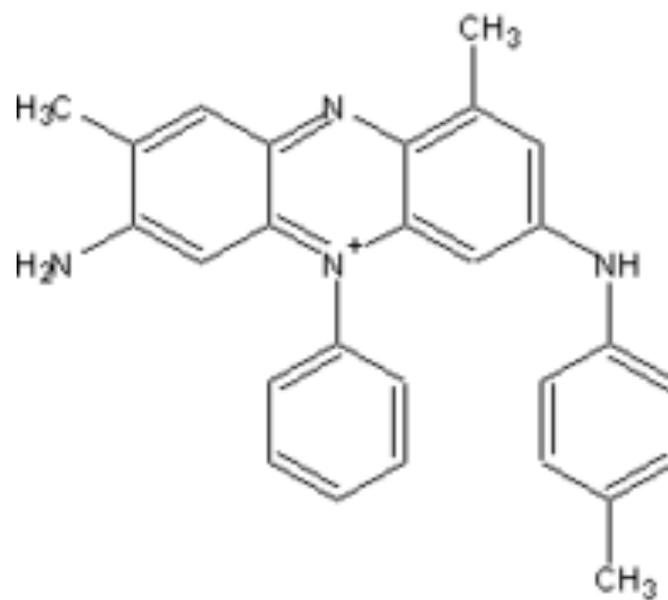
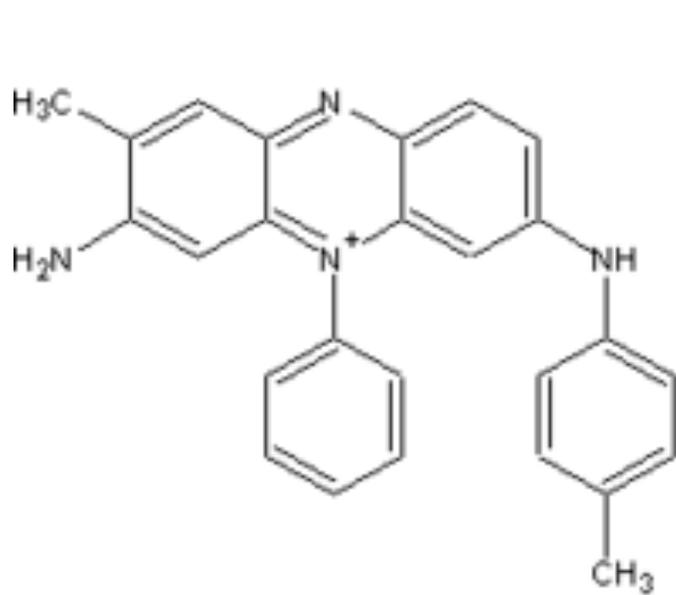


Mauveine



http://www.rsc.org/Chemsoc/Activities/Perkin/2006/minisite_perkin_mauveine_non_flash.html

Mauveine



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4) Examples from the recent literature

Is the Acetate Anion Stabilized by Resonance or Electrostatics? A Systematic Structural Comparison

Paul R. Rablen

Contribution from the Department of Chemistry, Swarthmore College, 500 College Ave., Swarthmore, Pennsylvania 19081-1397

Received August 9, 1999

Abstract: Using *ab initio* MO theory, a series of isodesmic reactions was studied in which nitrogen-, oxygen-, and fluorine-containing species acted as proton donors and acceptors. Comparison of protonation and deprotonation energies suggests that approximately three-quarters of the enhanced acidity of acetic acid comes from electrostatic stabilization, while the remaining quarter results from π resonance. Similar logic shows that only one-third of the enhanced acidity of the nitrogen analogue acetamidine is electrostatic in nature, and that the remaining two-thirds derives from resonance. The primary importance of electrostatics for oxygen and of π resonance for nitrogen is further supported by the behavior of carbonic acid and guanidine. The contributions of hydroxy, amino, and fluorine substituents to the acidity and basicity of a series of alcohols and amines are well described by a simple electrostatic model with a single adjustable parameter. The model requires the electrostatic contributions of polar bonds to be additive, to be of equal magnitude but opposite sign for anions and cations, and to be strictly proportional to the electronegativity differences between the atoms comprising the bonds. Application of this model to a series of reactions lacking π bonds results in a correlation coefficient of 0.99, and indicates that on average C–F bonds contribute 15 kcal/mol, C–O bonds 9 kcal/mol, and C–N bonds 4 kcal/mol to differential acidity and basicity. Further application of the model allows an estimation of π resonance contributions to the acidity and basicity of acetic acid and a series of related compounds. These π resonance contributions are found to be much greater for nitrogen than for oxygen, and significantly greater for acidity (anions) than for basicity (cations).

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5) Timing of stories and demos

6) Use humor

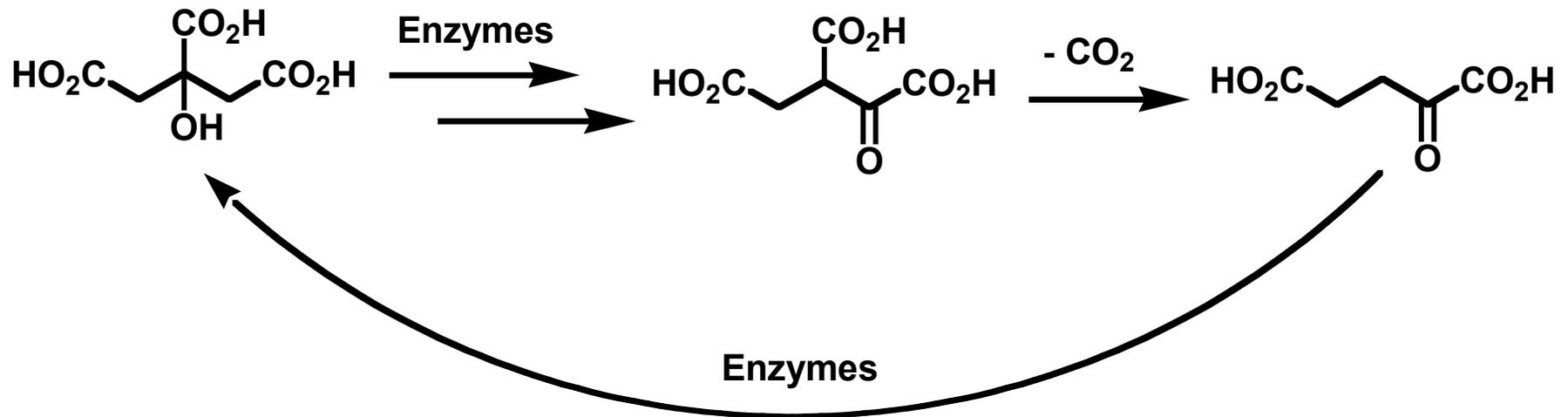
Decarboxylation

- Decarboxylation in the citric acid (Krebs) cycle

In a biology course:

<http://www.science.smith.edu/departments/Biology/Bio231/krebs.html>

In CHEM 250:



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5) Job shadowing / coop program

6) Guest speakers / industrial chemists

Drugs in Afghanistan



- Opium derived from the poppy *Papavera somnifera* is widely grown and used in Afghanistan, and is one of the worlds major supplier of the drug. The problem is that farmers will grow opium instead of food to feed their village.

Lt Brendan Clancy in Afghanistan 03 Feb
06 – 06 Aug 06

Milking the Latex



- These scores on the pericarpal capsule indicate that the latex have been milked. A field worker will come by and score the poppy, when he has done an entire row he will return to collect the latex with a large “spoon” looking device and place it in a bag.

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7) Problem-solving approaches

8) Fun fact Friday

9) Make nomenclature interesting!

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- Labs should be a turn-on, not a turn-off
- Feedback halfway through the semester and/or at the end

Amines



Cadaverine



Putrescine



***Rafflesia* flower**

<http://radio.weblogs.com/0105910/2004/01/14.html>