

A Mean Recipe(s)

May 10, 2013

- Preparation of amines (continued).
 - Reduction of nitriles (review), amides (review), and nitro groups.
 - Reductive amination.
 - The Hofmann and Curtius rearrangements.
- NO⁺ and the chemistry of nitrosamines and aryldiazonium salts.

Announcements

Midterm results: Average = 45.4/100, Std. Dev. = 14.3, High = 83. Exams will be available for pick-up after class on Friday. The key will be posted online early next week.

An optional take-home **15 pt Midterm Exam Supplement** will be made available after class on Friday and will be due on Monday at 10:00 am. It consists of select midterm problems and can be worked in conjunction with access to Loudon and your course notes.

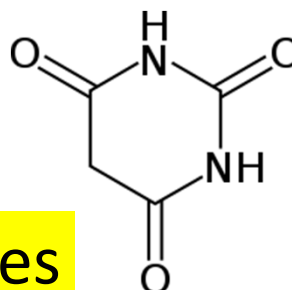
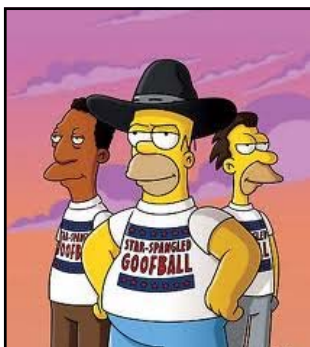
Mid-quarter grades will be posted early next week. Intermediate grades will be set according to a curve where the average mark is a B+.

Students who wish to meet with me and discuss their standing in the course, or any other matters pertaining to 41c, are encouraged to make an appointment.

Quiz 3 is scheduled for Friday, May 17. The focus of this quiz will be Chapter 23 (amines). A review sheet has been posted on the course website. It includes a point allocation projection and the 'think deeply' topic: "**Basicity and Acidity of Amines**" (Loudon, pp 1122-29)

TA Office Hours: Mon 7-8 pm: Rob Craig - 302 Schlinger (x4056); Tue 3-4 pm: Kelly Kim - 302 Schlinger (x4047); Tue 7-8 pm: Corey Reeves - 302 Schlinger (x4056); Wed 5-6 pm: Adam Boynton - 139 Noyes (x3202); Wed 8-9 pm: Ben Suslick (UTA) - Lloyd Lounge; Thu 8-9 pm: Evan Zhao (UTA) - Fleming Lounge; Thu 9-10 pm: Crystal Chu - 202 Schlinger (x3634); Sun 3-4 pm: Chung Wan Lee - 302 Schlinger (x4056).

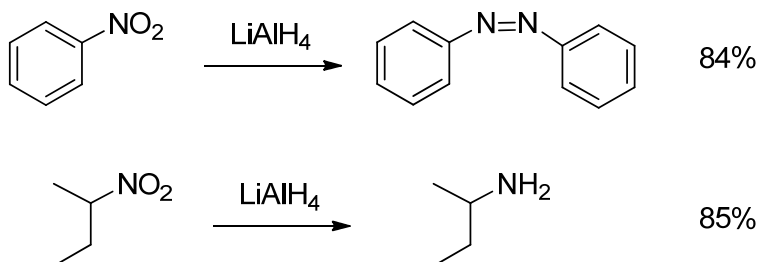
Suggested Problems for Chapter 23: 23.38, 23.50 (a,c,f), 23.53 (a,c), 23.56 (b,c), 23.59 (a,b,h), 23.60 (a,h,l), 23.65 (c), 23.71, 23.72 (a), 23.73.



Barbituates

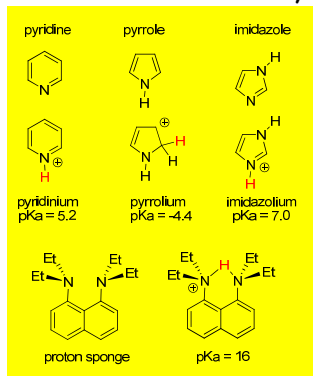
In the 1940s, military personnel were given "Goofballs" during WWII in the South Pacific region to allow soldiers to tolerate the heat and humidity of daily working conditions. Goofballs were distributed to lower the respiratory system and blood pressure to combat the extreme conditions. Many soldiers returned with addictions that caused several months of rehabilitation before being discharged. This led to addiction problems through the 1950s and 1960s.

“Nitromethane, undiluted, reacted with $[\text{LiAlH}_4]$ at room temperature with explosive violence. The higher aliphatic nitro compounds were less reactive but it proved advantageous to add these in the form of dilute ether solutions.

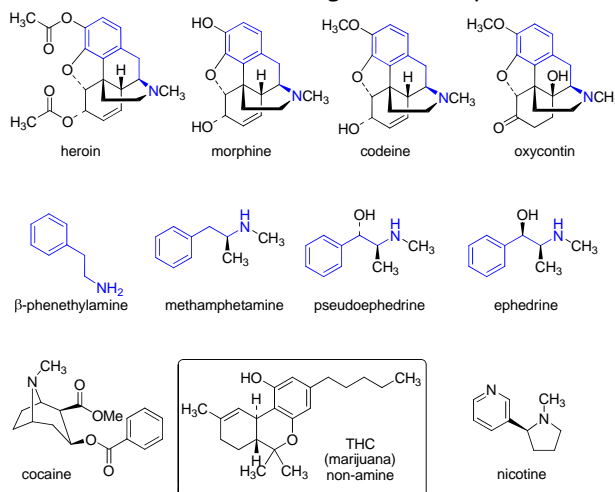


JACS, 1948, 70, 3738.

Other Amines, Including a Few Relevant Examples

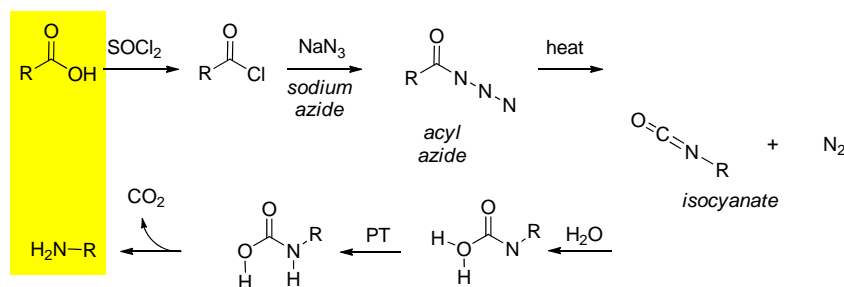


Amines with biological activity:

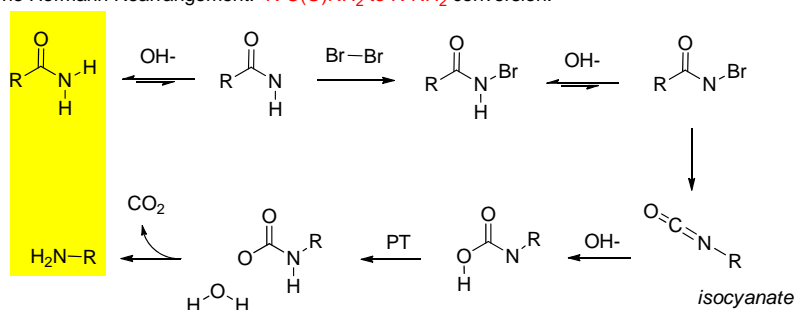


Part of the Bayer product line, 1898

The Curtius Rearrangement: $R\text{-CO}_2\text{H}$ to $R\text{-NH}_2$ conversion.

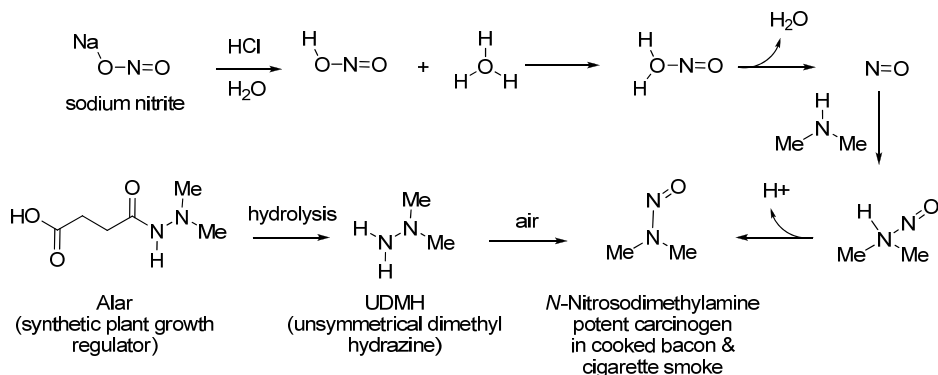


The Hofmann Rearrangement: $R\text{-C(O)NH}_2$ to $R\text{-NH}_2$ conversion.



Food Chemistry/Safety: Real Issues and Media Hype

Secondary amines react with HONO (well, actually NO^+) to give N -Nitrosoamines:



1986-89: Public fear of Alar-treated apples peaked; a *60 Minutes* story suggested a cancer risk and groups began to lobby the EPA for a ban & grocery chains stopped accepting apples treated with Alar.

Mid-1990s: It was revealed that the risk would require a person to drink 5,000 gallons of apple juice per day. One mushroom contains 20 times the level of UDMH than an Alar-treated apple. **Alar Scare** is shorthand for an irrational, emotional public scare based on propaganda rather than facts. Wiki/Alar