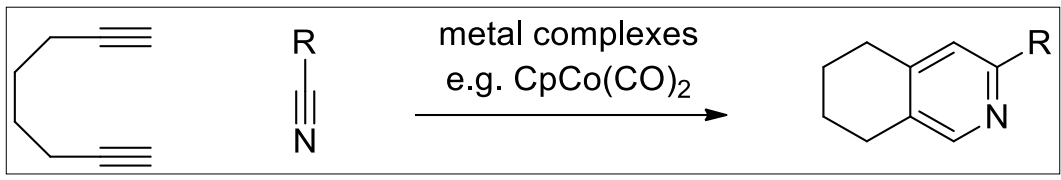


Fonction et réaction organiques II

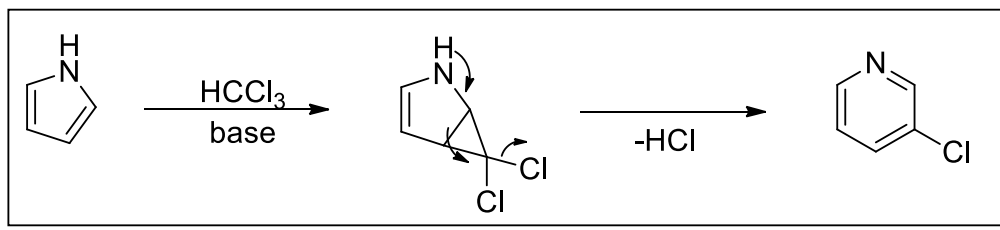
week 9

2.4.1. Pyridine syntheses

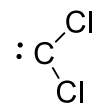
- [2+2+2] cyclotrimerization for pyridine synthesis



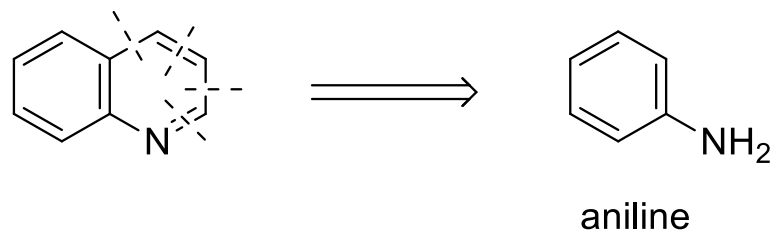
- The Ciamician Dennstedt reaction: pyridines by ring enlargement of a pyrrole



proceeds via a carbene intermediate



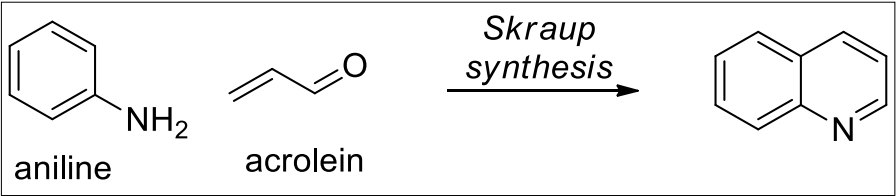
- General strategies:



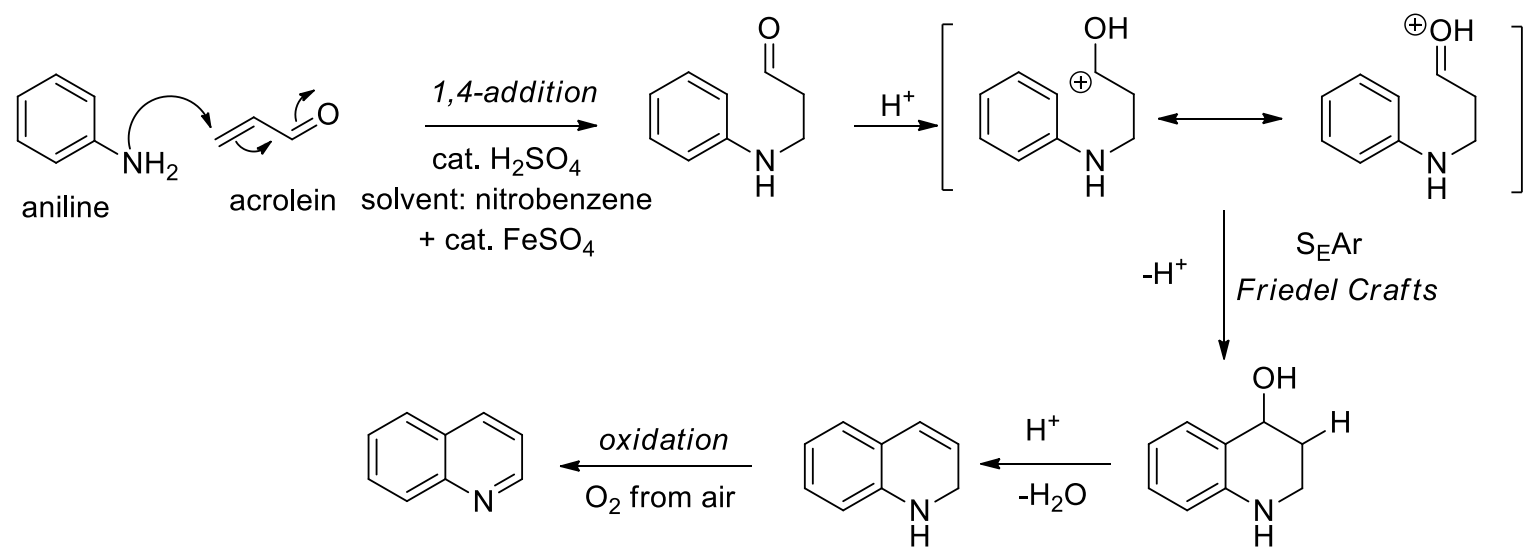
- The ring containing the heteroatom is the one which is constructed
- There are several possibilities to perform it always starting with an aniline

2.4.2. Quinoline syntheses

- Skraup quinoline synthesis:

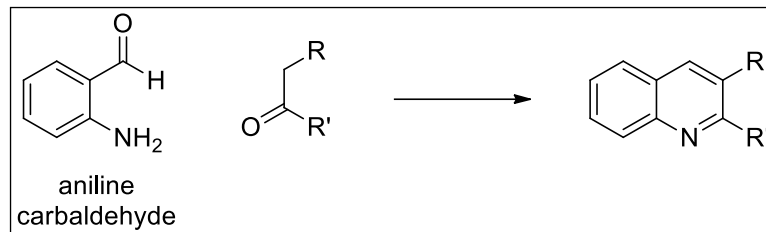


- Mechanism



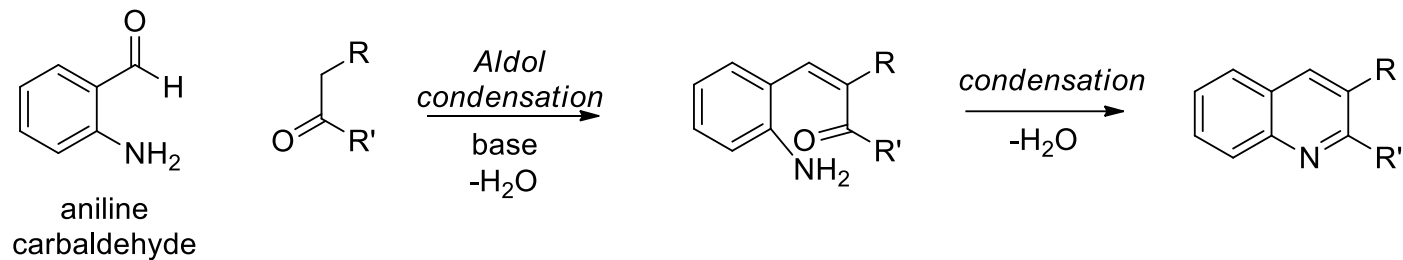
2.4.2. Quinoline syntheses

- Friedländer quinoline synthesis



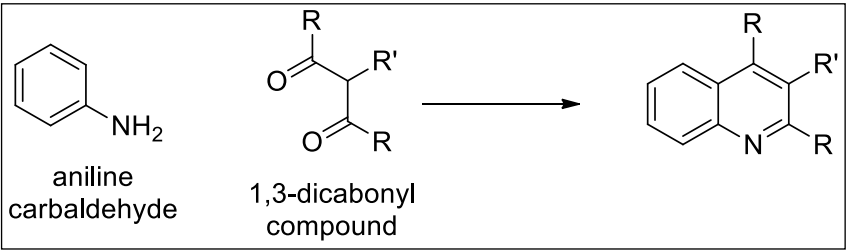
- Advantage: flexibility in the substitution pattern

- Mechanism:

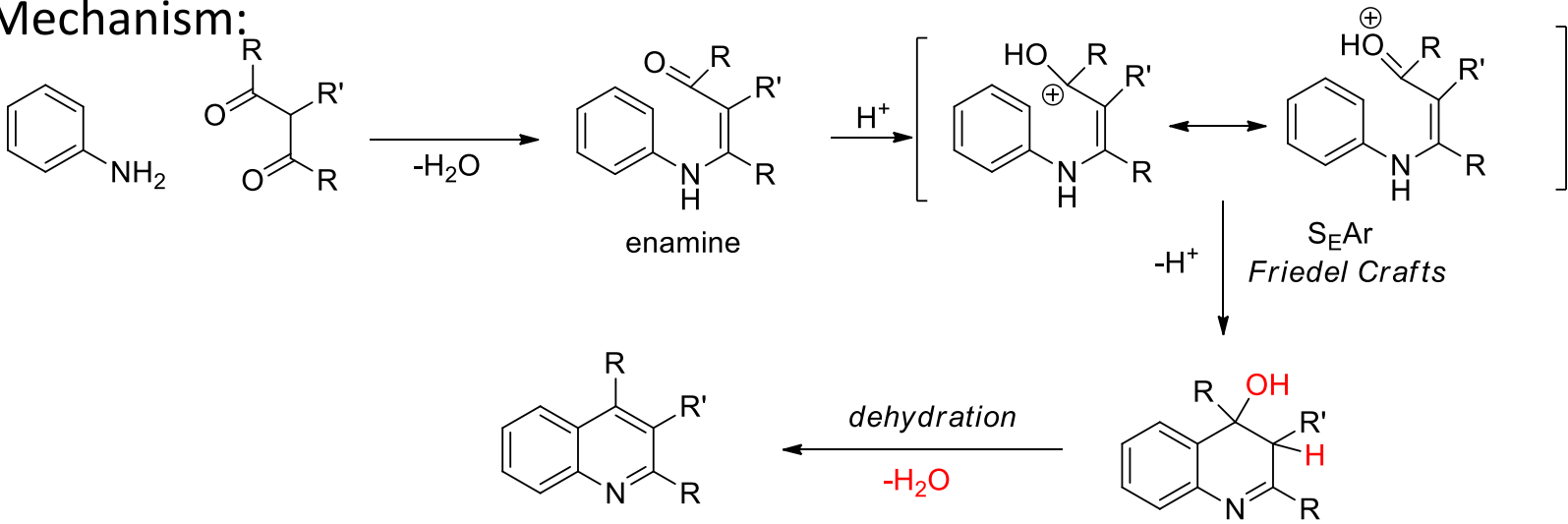


2.4.2. Quinoline syntheses

- Combes quinoline synthesis:

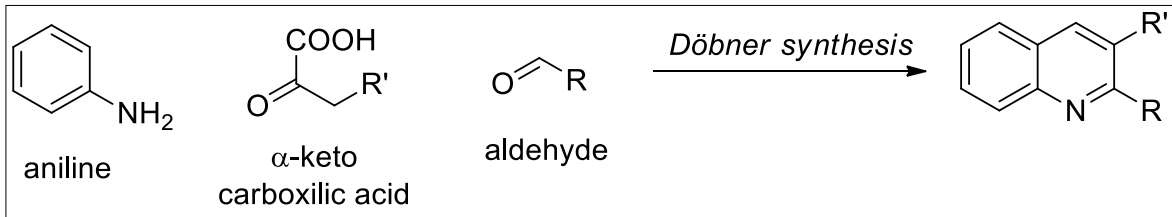


- Mechanism:

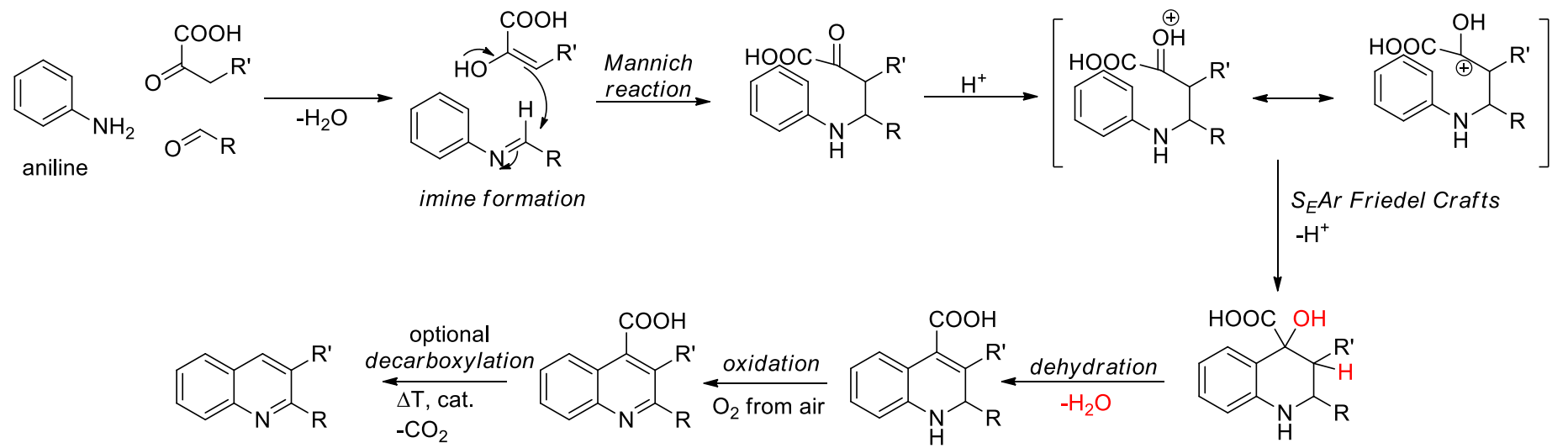


2.4.2. Quinoline syntheses

- Döbner quinoline synthesis:

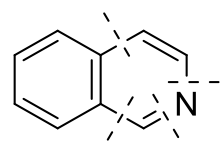


- Mechanism:

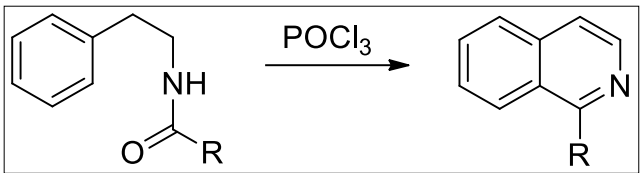


2.4.2. Isoquinoline syntheses

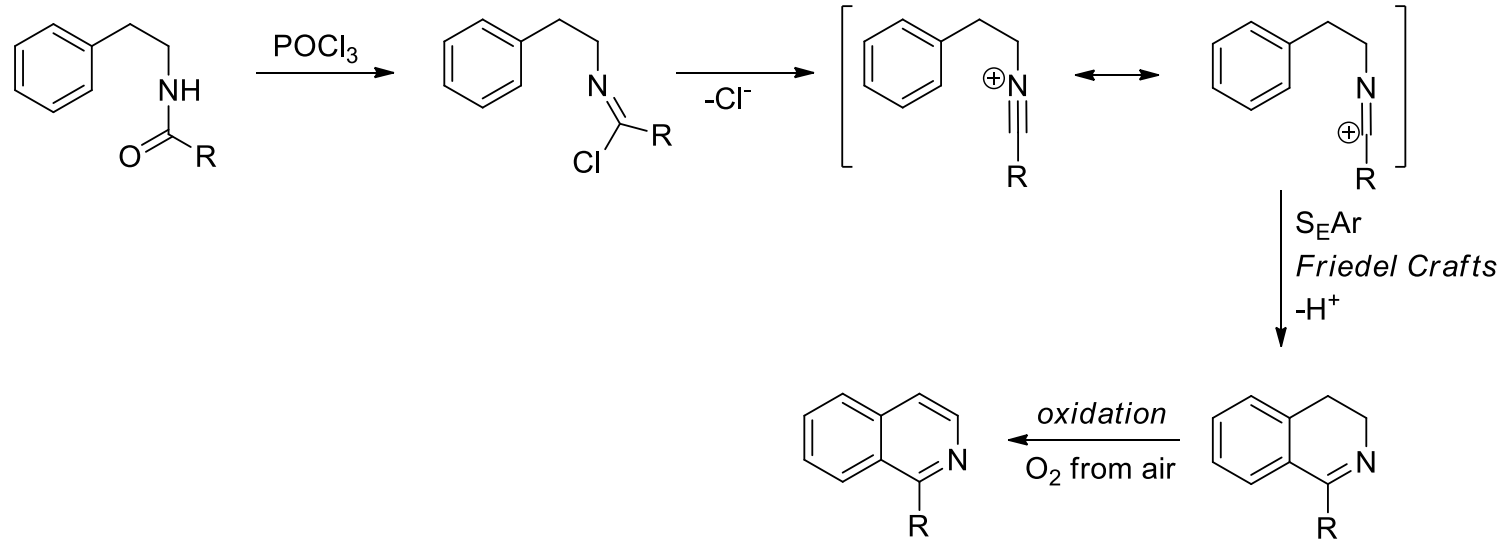
- Strategic disconnections:



- Bischler-Napieralski isoquinoline synthesis:

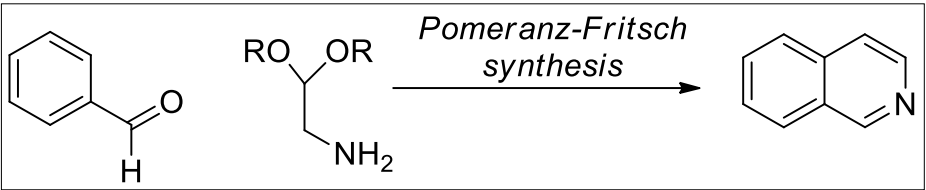


- Mechanism:

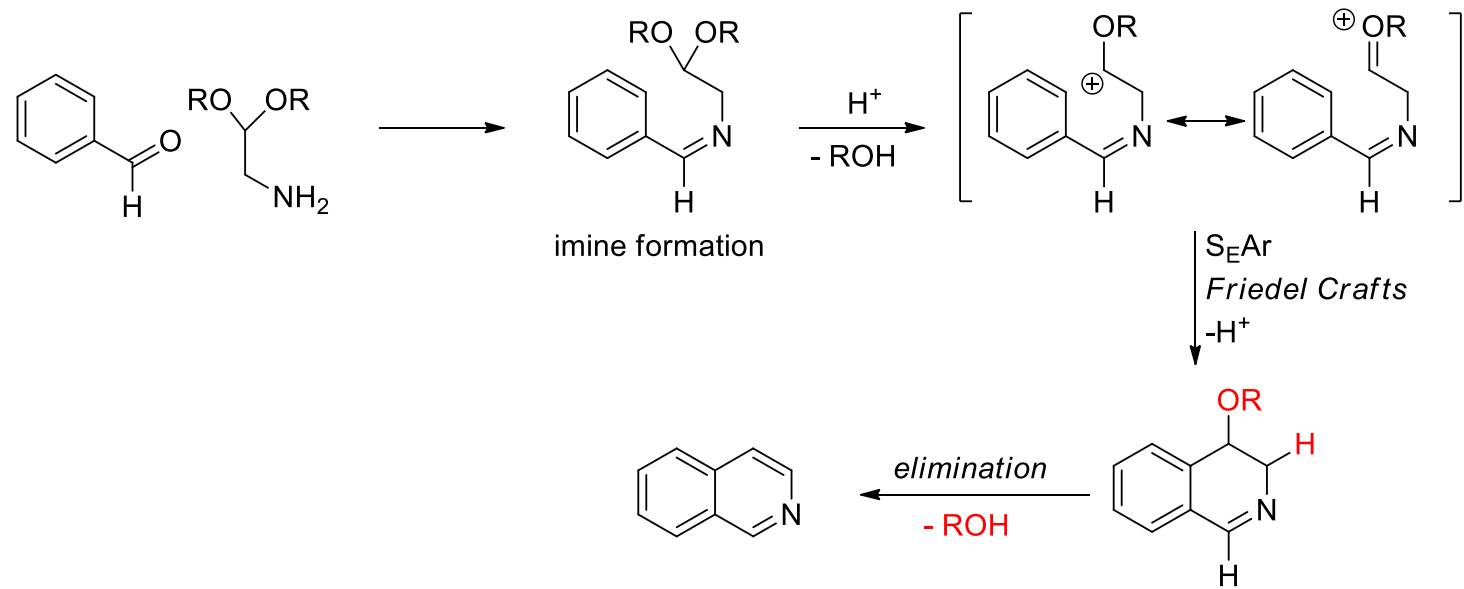


2.4.2. Isoquinoline syntheses

- Pomeranz-Fritsch isoquinoline synthesis:



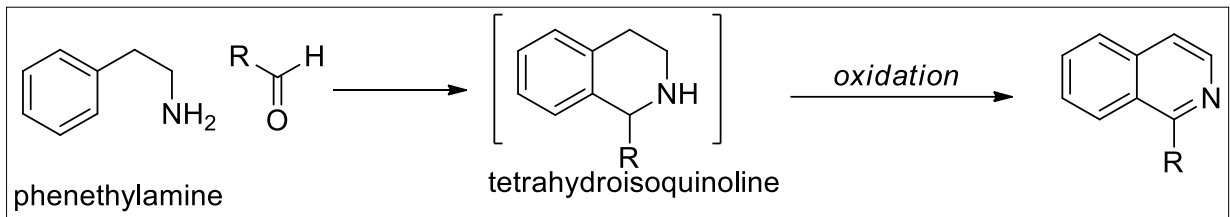
- Mechanism:



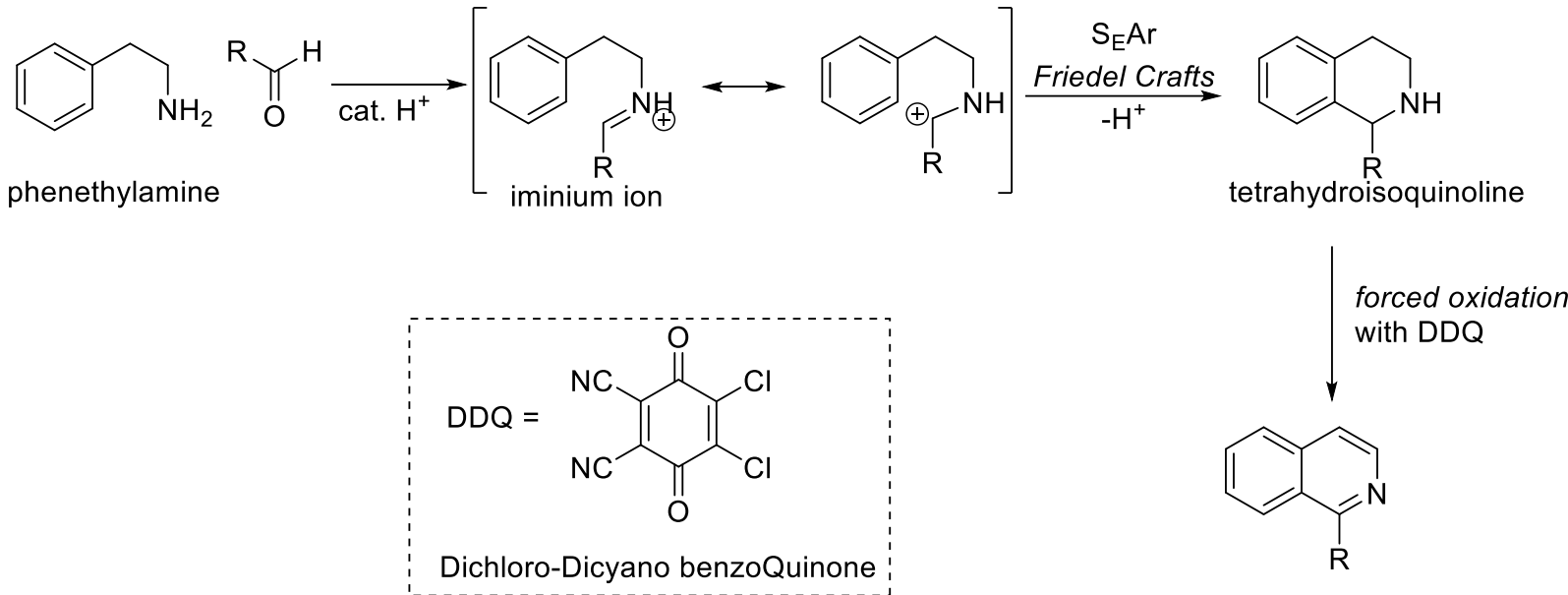
2.4.2. Isoquinoline syntheses

- Pictet-Spengler reaction:

This is a more general reaction for several ring size, but used here for the synthesis of isoquinolines



- Mechanism:



PDE-5 inhibitor
phosphodiesterase

