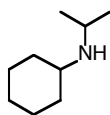
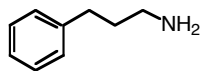


Answer Key
Problem Set 9

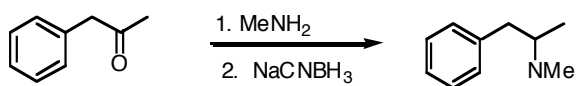
1.



2.

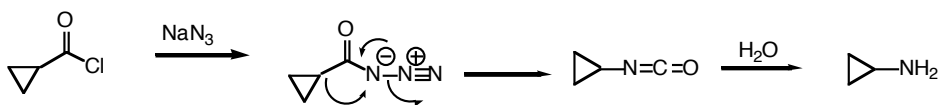


3.

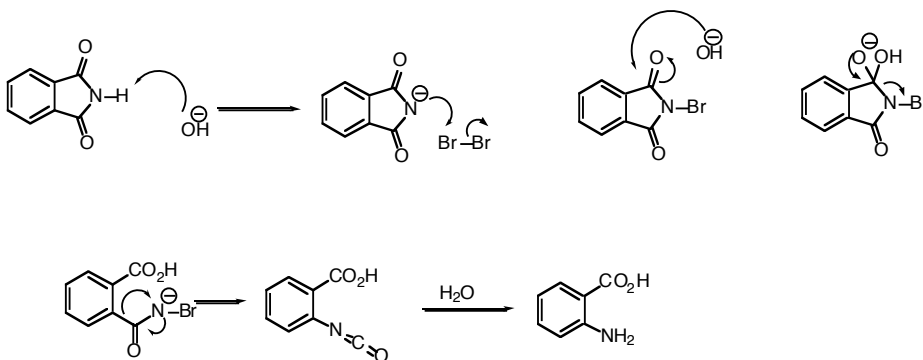


Separate with an acid wash. The protonated amine will go into the water layer and the ketone will stay in the organic layer. After separating, use base to recover the free amine.

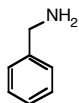
4.



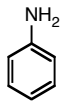
5.



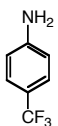
6.



1. (most basic) – the lone pair on amine is not in conjugation with the aromatic ring

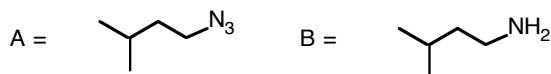


2. Lone pair in conjugation with the ring – protonation would break up the conjugation

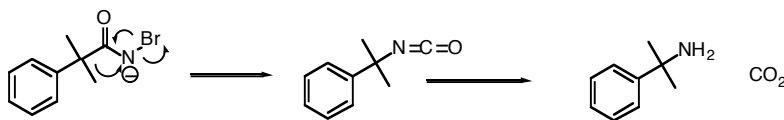
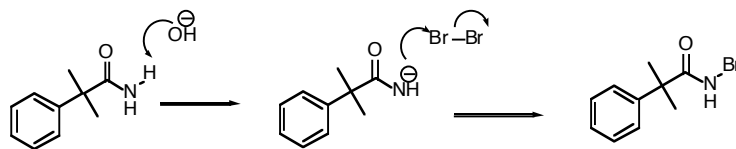


3. (least basic) – withdrawing group on the ring pulls electron density away from the Nitrogen making it less basic

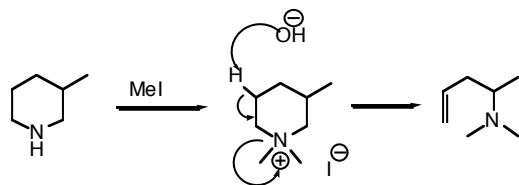
7.



8.

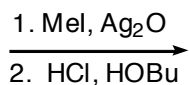


9.



10. Enantiomers

11.



12.

13.

