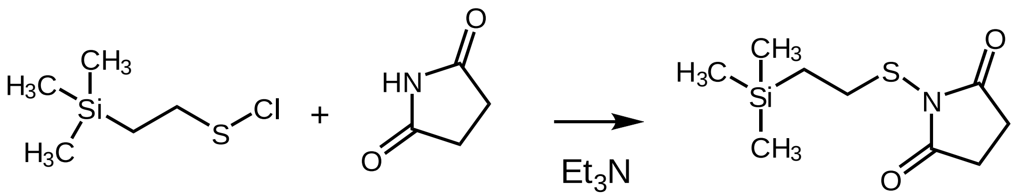
Problem 5



J. Peng and D. L. Clive, J. Org. Chem., 2009, 74(2), 513-519.

1. Draw all of the bonds at the reactive atoms in the starting materials

2. Draw all of the H-atoms at or near the reactive sites of the starting materials and the products

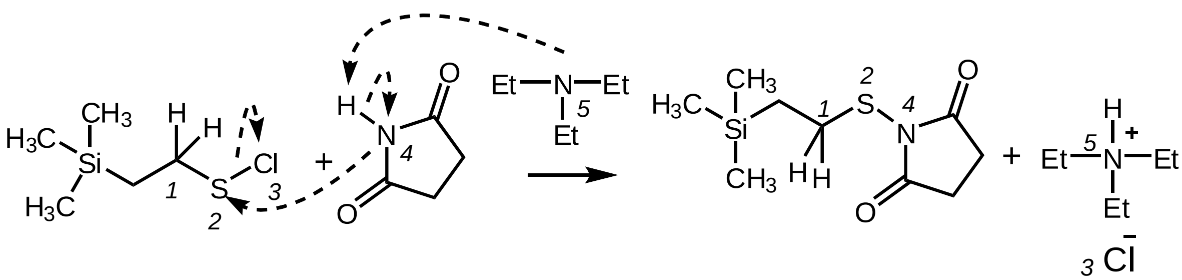
3. Balance the equation

4. Number the non-H atoms

5. Identify the bonds made and broken

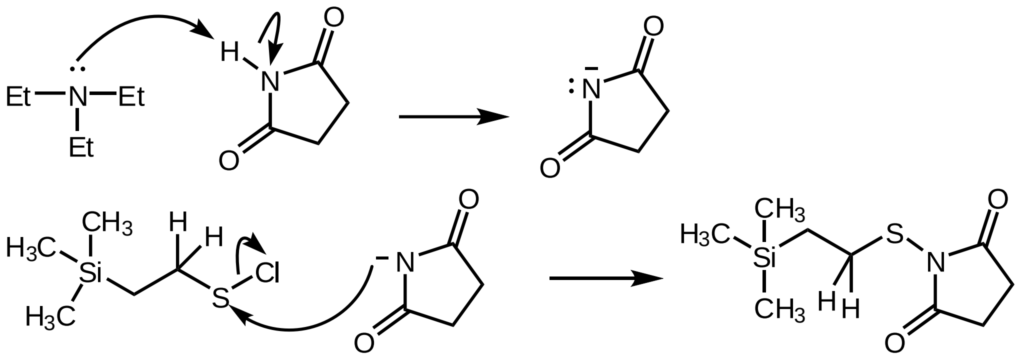
Bonds made: 4-2, 5-H

Bonds broken: 2-3, 4-H.



Identify the conditions:
Basic (does not generate strong acids)

Mechanism:



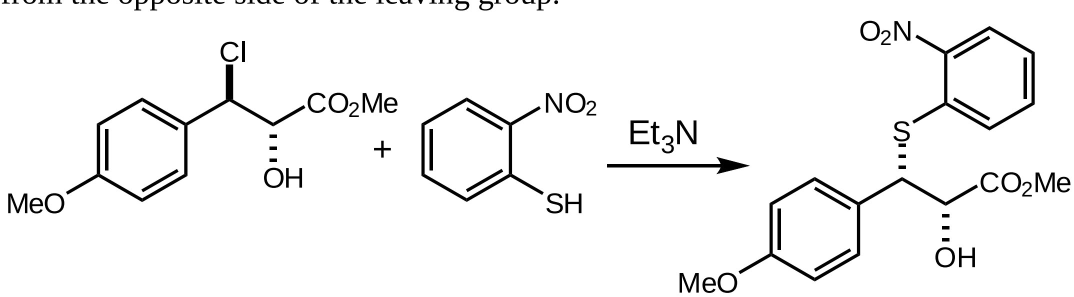
Discussion:

1. Once the first curved arrow is drawn, most of the other curved arrows can be drawn by looking at the dotted arrows going to the reactive site. Reactive sites are usually at or near the head or tail of the curved arrow. In this example after the first step, the reactive site was at the nitrogen atom labeled as 4. The only dotted line going from 4 was used to draw the next arrows.

2. One may ask why the deprotonation is shown first. The answer is because triethylammonium chloride is a weaker acid than succinimide. *Remember*: Equilibrium always favors the formation of weaker acid.

3. This may be the first time that you are seeing a structure where Si is attached to any compound. There is no need to panic because of it. In the above question, the analysis suggests that nothing is happening at the Si atom or at the atoms directly attached to it. Hence, it can be treated just like any other group that is not being used in the reaction mechanism.

Now try the following. Keep in mind that in an S_N2 reaction, the nucleophile approaches from the opposite side of the leaving group.



Ref.: Wyatt, P. and Warren, S., Organic Synthesis: Strategy and Control; John Wiley and Sons Ltd., West Sussex, 2007.