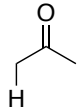
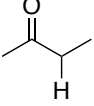
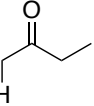
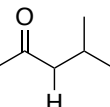
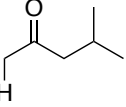
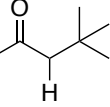
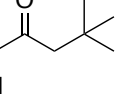
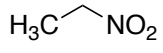
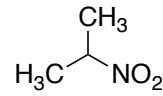


1. Rationalize the following rates of deuteration of alkyl ketones.

Ketone	Relative Rate
	100
	41.5
	45
	<0.1
	45
	0.45
	5.1

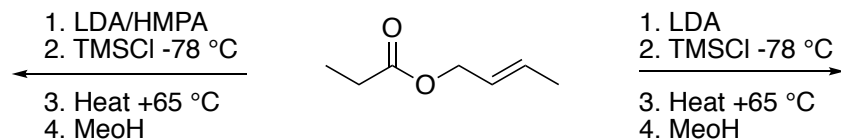
2. Name and show an example of six major organic reactions which involve the formation of and use of an enolate.

3. Explain the following

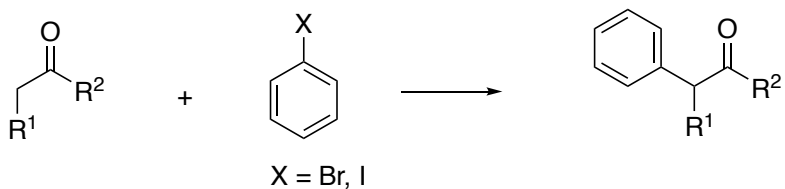
	Kinetic Acidity $k$ ( $M^{-1} \text{ min}^{-1}$ )	Thermodynamic Acidity (pKa)
$H_3C-NO_2$	238	10.2
	39.1	8.5
	2.08	7.7

4. The acid catalyzed enolization of cyclohexanone shows a  $k_H/k_D$  of ~5. Explain using structures and mechanistic arrows

5. Predict products for the following and rationalize your answer



6. How would you carryout the following?



7. Explain the following.

