

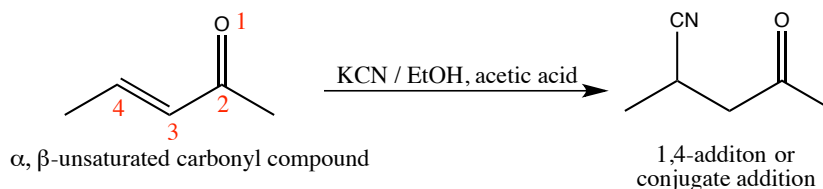
## Chem 345 – Organic Reactions Chapter 22

Prepared by José Laboy, MS

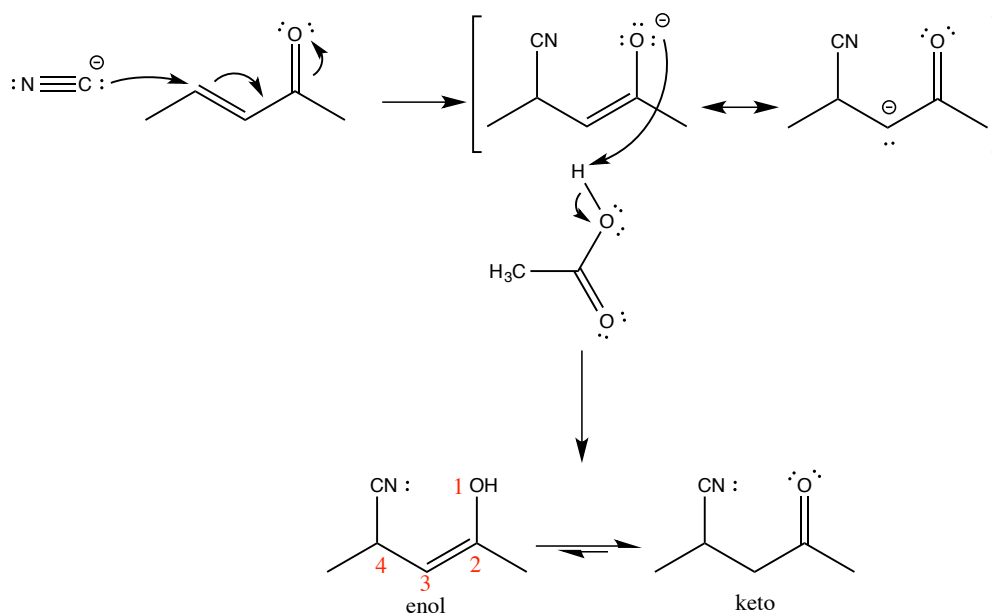
[http: www.chem.wisc.edu/areas/clc](http://www.chem.wisc.edu/areas/clc) (Resource page)

### $\alpha$ , $\beta$ -Conjugate Addition (Michael Addition)

Reaction:



Mechanism:



Strong bases react with  $\alpha$ ,  $\beta$ -unsaturated carbonyl compounds adding to the carbonyl, that is 1,2-addition. Examples are organolithium, Grignard reagents,  $\text{LiAlH}_4$ . On the other hand, weak bases but good nucleophiles undergo 1,4-addition or conjugate addition. Examples are: KCN, thiols, enols, enolates,  $\text{LiCu}(\text{CH}_3)_2$ .

