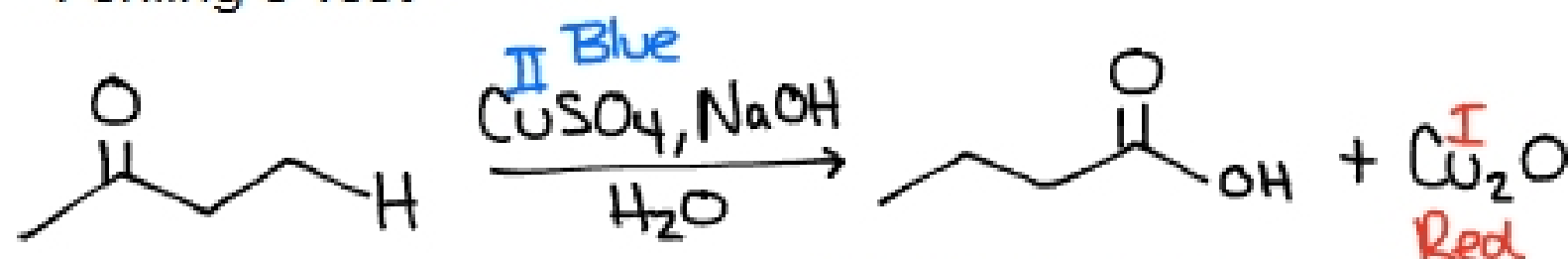
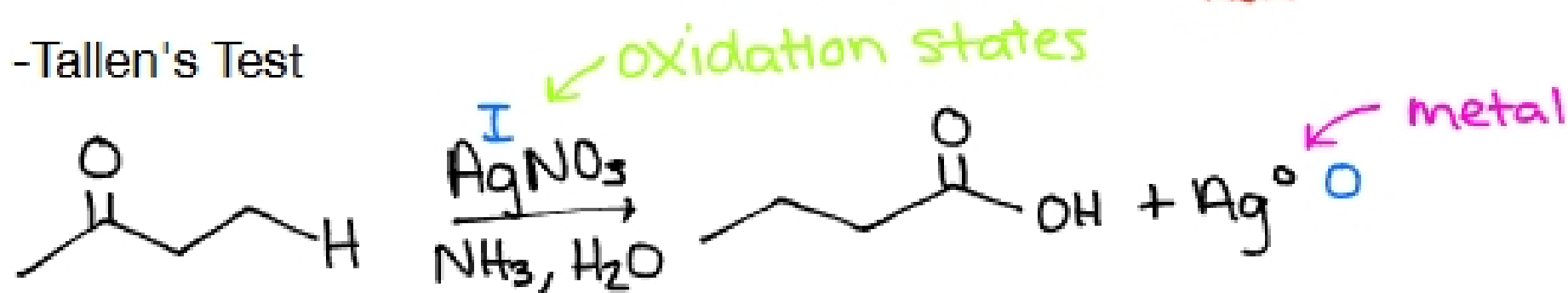


## Chemical Tests for Aldehydes

-Fehling's Test



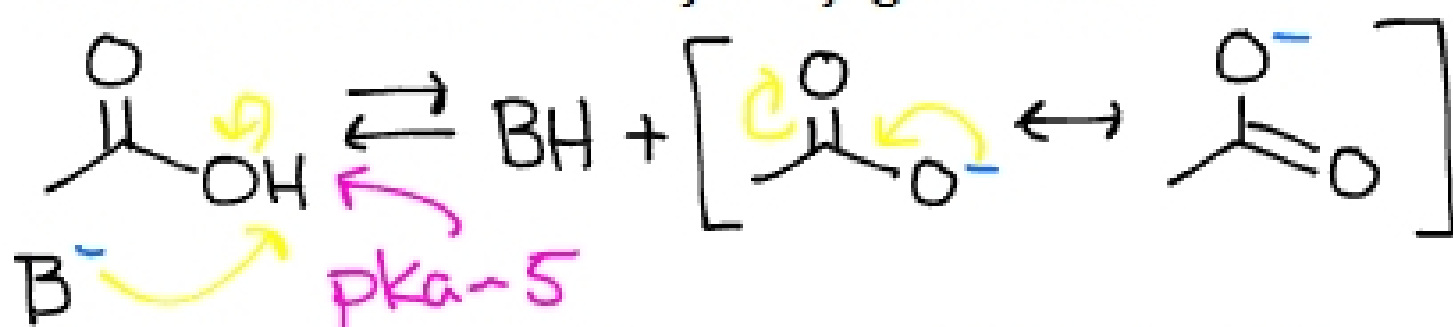
-Tollen's Test



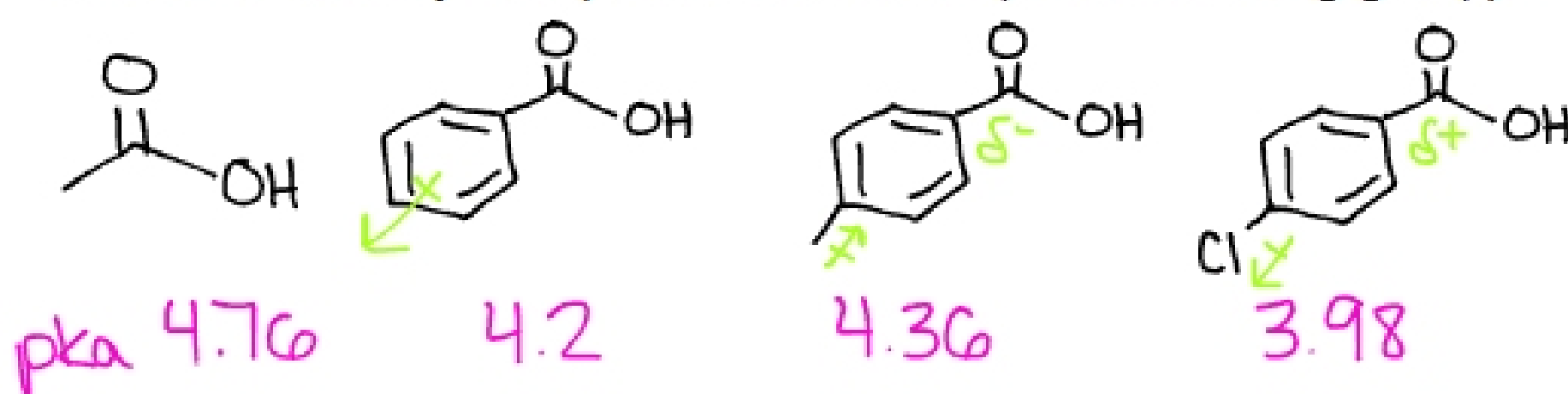
## Chapter 19 & 20: Carboxylic Acids and Derivatives

### Acidity and Basicity

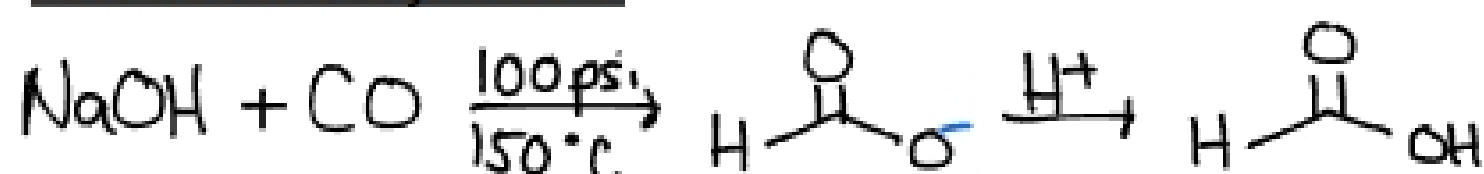
-Resonance stabilized by conjugate base



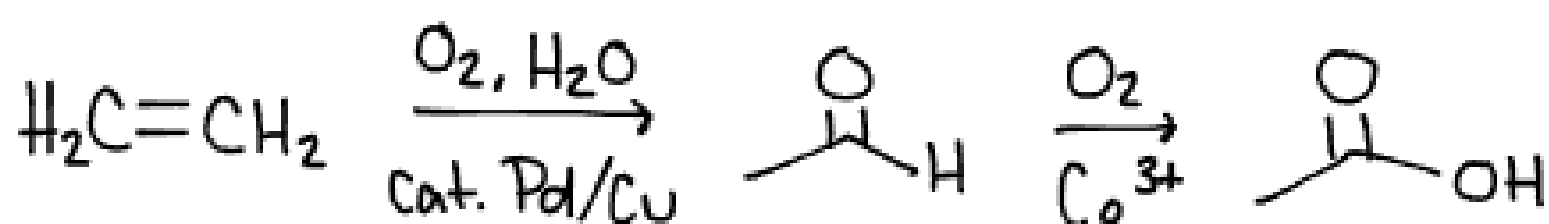
-Increased acidity with presence of EWG (e- withdrawing group)



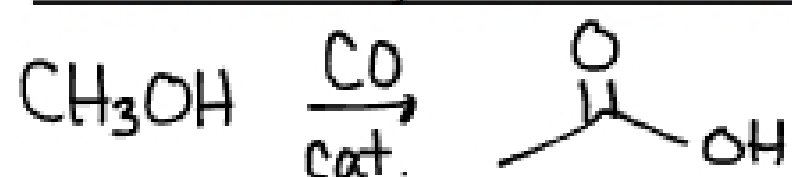
### Formic Acid Synthesis



### Acetic Acid Synthesis via Ethene Oxidation



## Acetic Acid Synthesis via Carbonylation



## Synthesis of COOHs

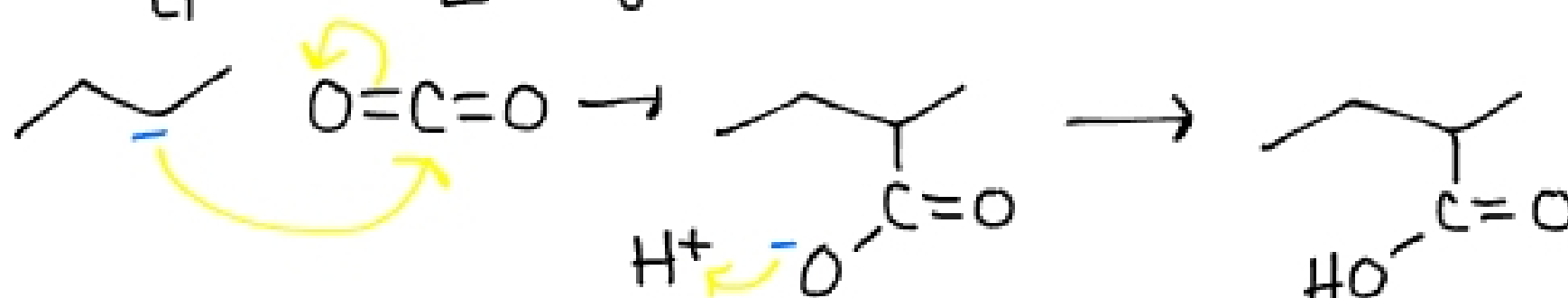
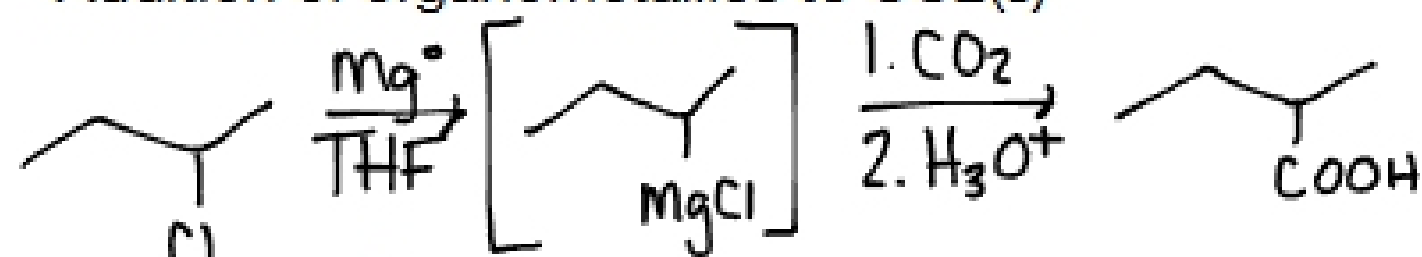
-Oxidation of primary alcohols and aldehydes

-CrO<sub>3</sub>/KMnO<sub>4</sub> (see above)

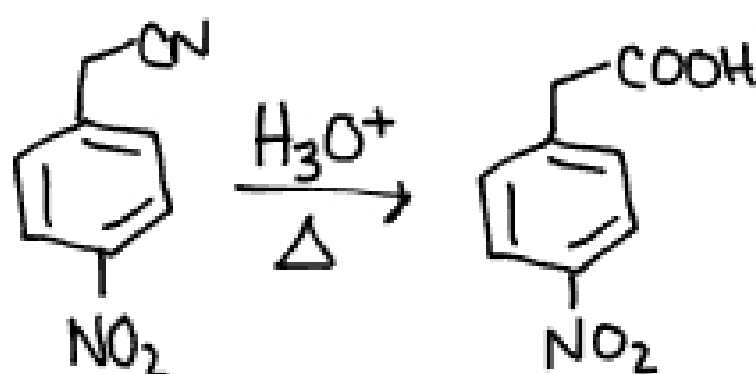
-dilute HNO<sub>3</sub>



-Addition of organometallics to CO<sub>2</sub>(s)

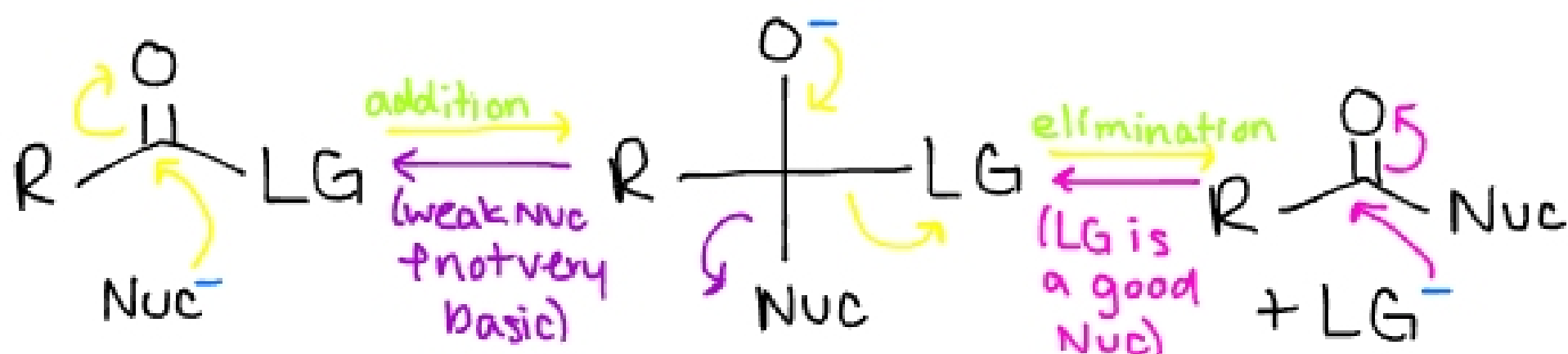


-Hydrolysis of Nitriles (H<sup>+</sup> or B<sup>-</sup>)

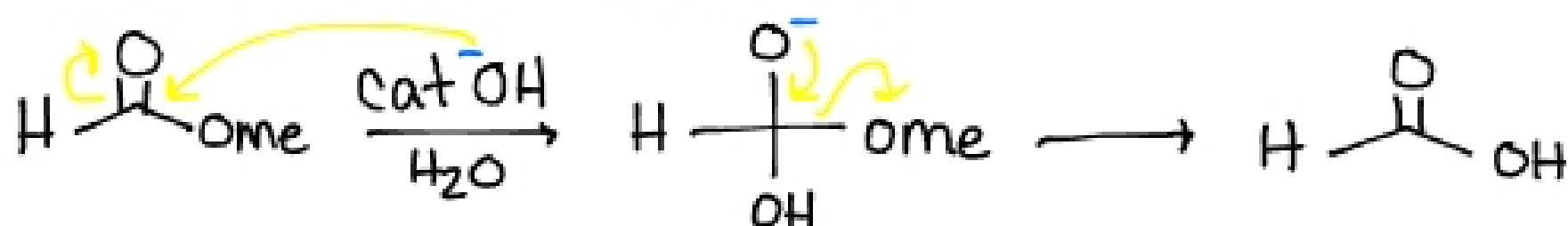


## Substitution at the Carbonyl

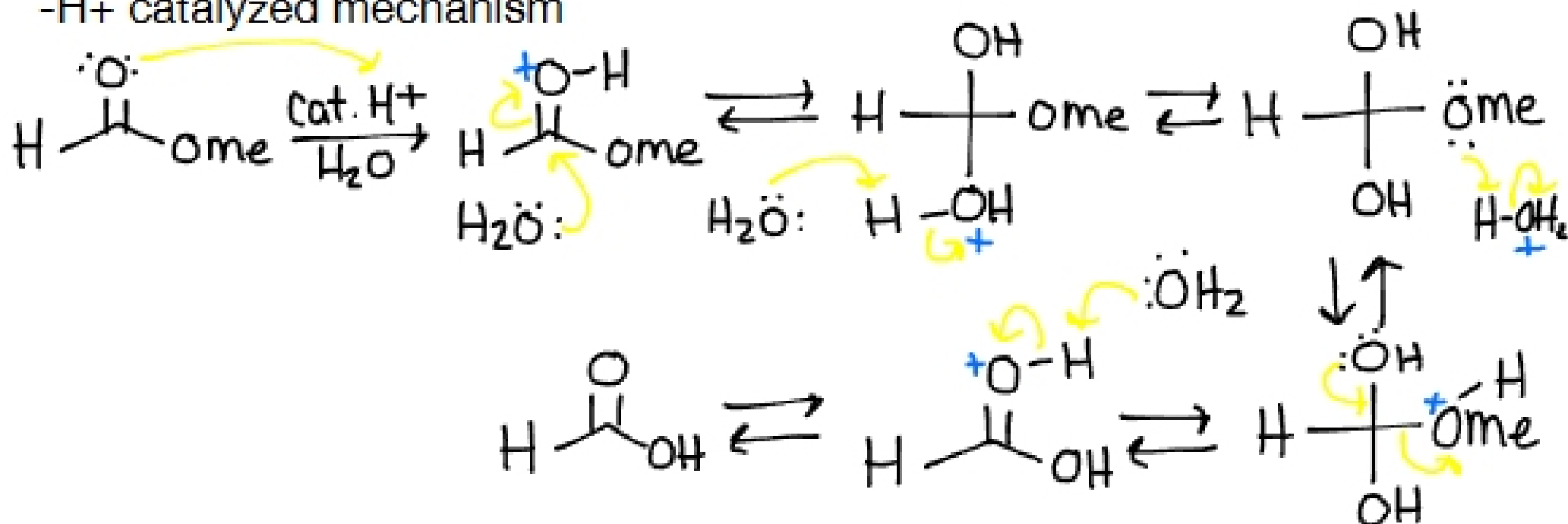
-via addition-elimination mechanism



-Base-catalyzed add-elim mechanism



-H<sup>+</sup> catalyzed mechanism



### Carboxylic Acid Derivatives



### Acyl Halides

-forming acyl halides

