Exam 1 - next Friday

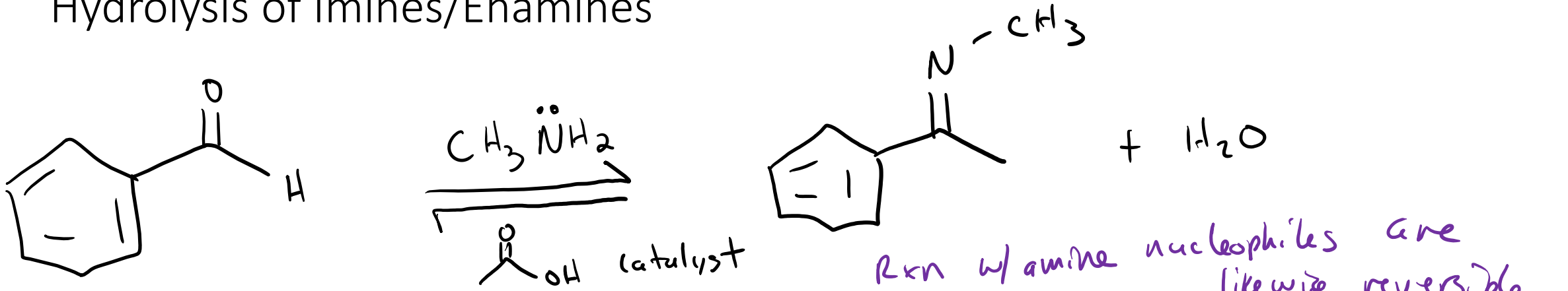
Resources on moodle

Imine/Enamine Hydrolysis

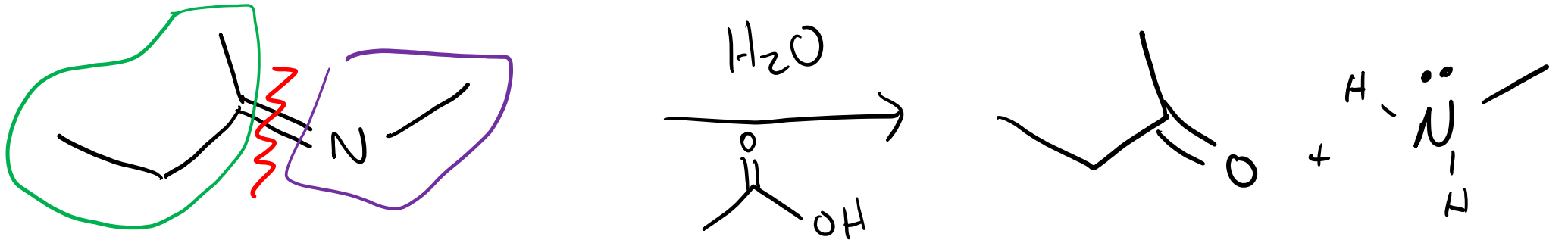
Hydrogen & Carbon Nucleophiles

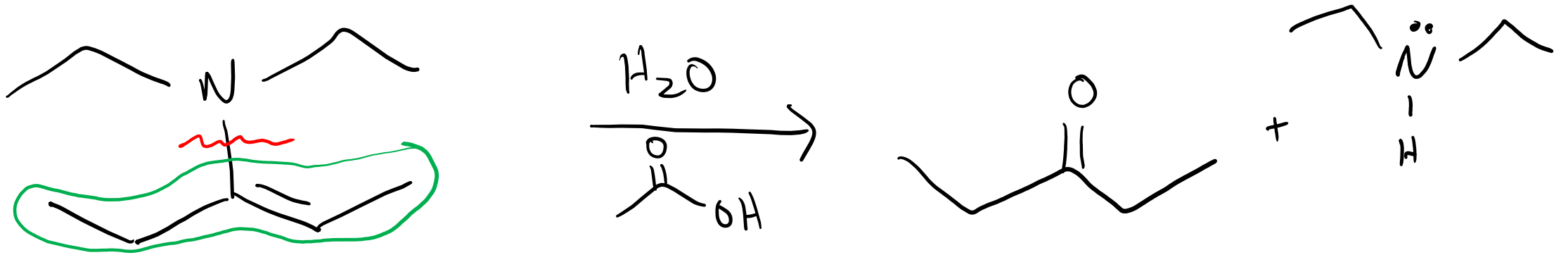
2/10/2023

Hydrolysis of Imines/Enamines

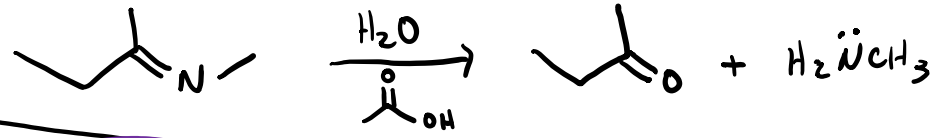


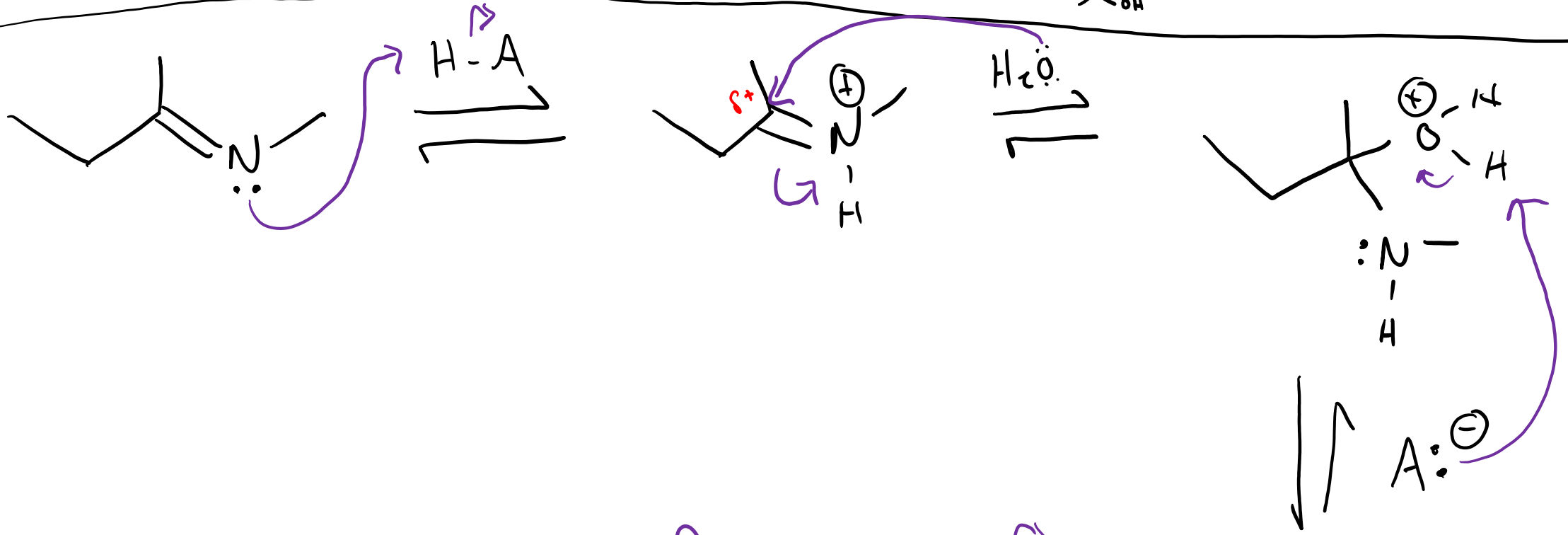
Rxn w/ amine nucleophiles are likewise reversible

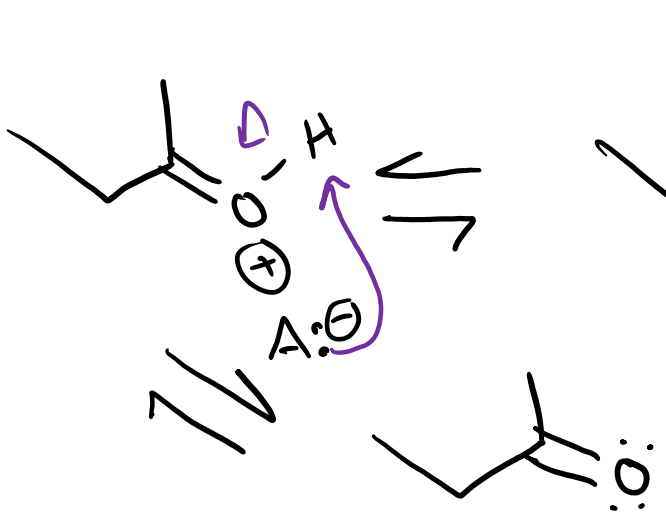


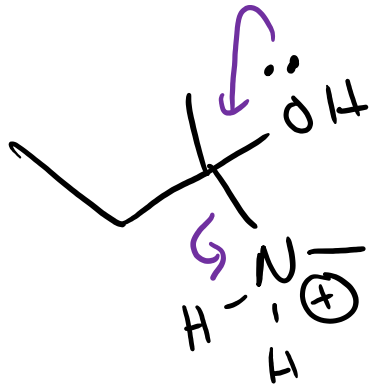


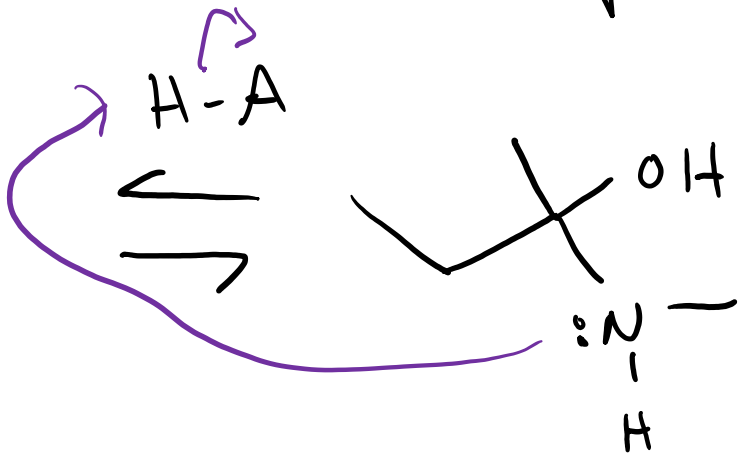
Hydrolysis of Imines: Mechanism





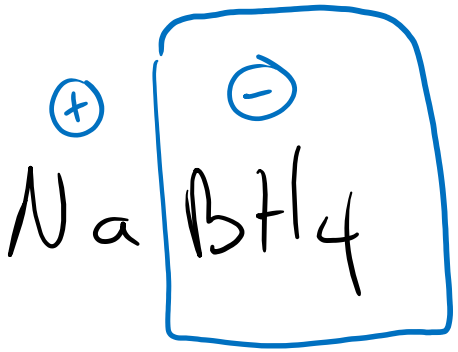






Hydrogen as a Nucleophile

(19.9, 12.4)

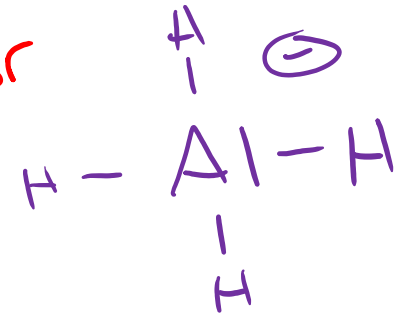


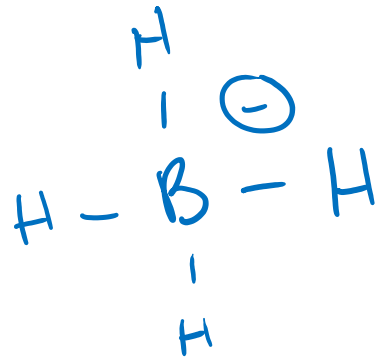
lithium aluminum hydride

LAH

sodium borohydride

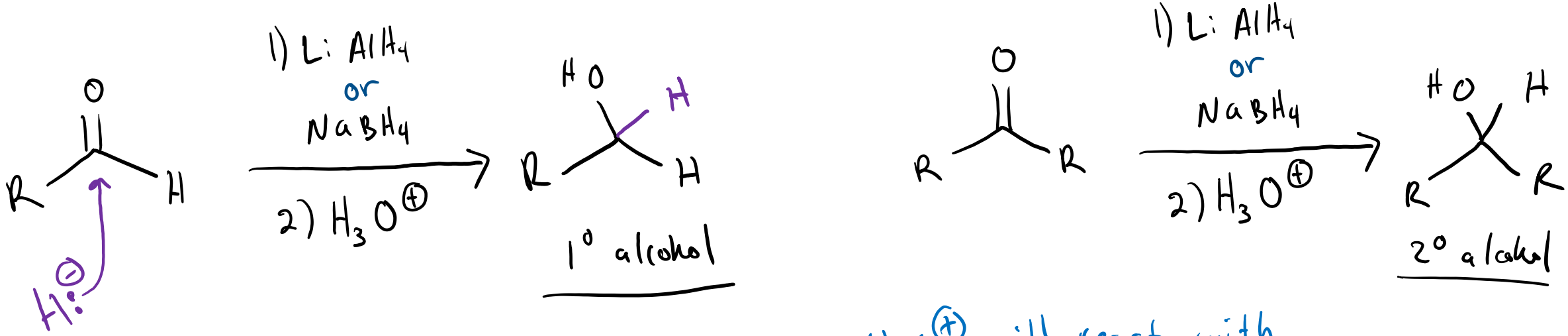
stronger $H:^{\ominus}$ donor



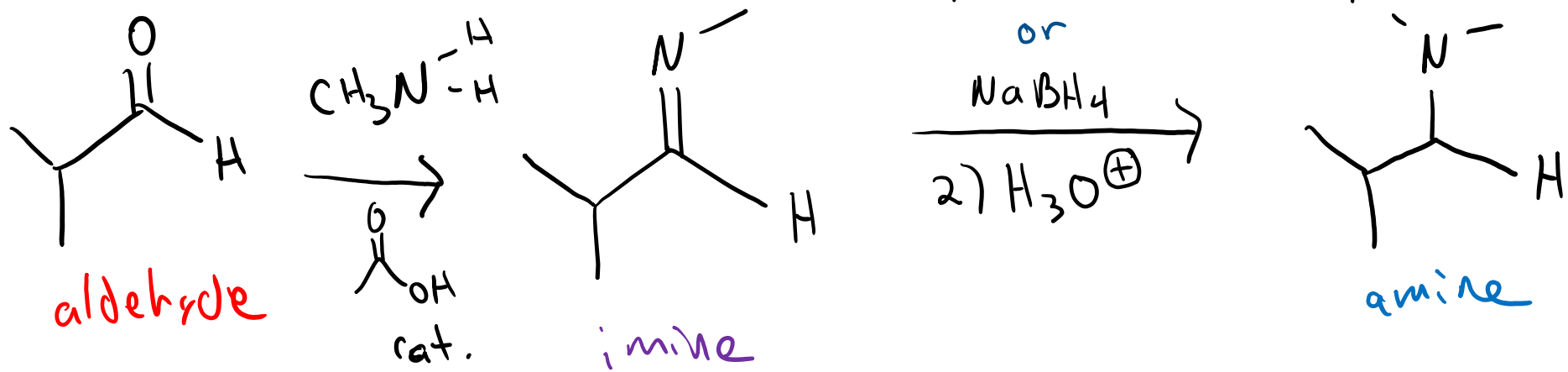


both react like "$H:^{\ominus}$" - a "hydride"

Hydrogen Nucleophiles: "Reducing" Ketones, Aldehydes, and Imines

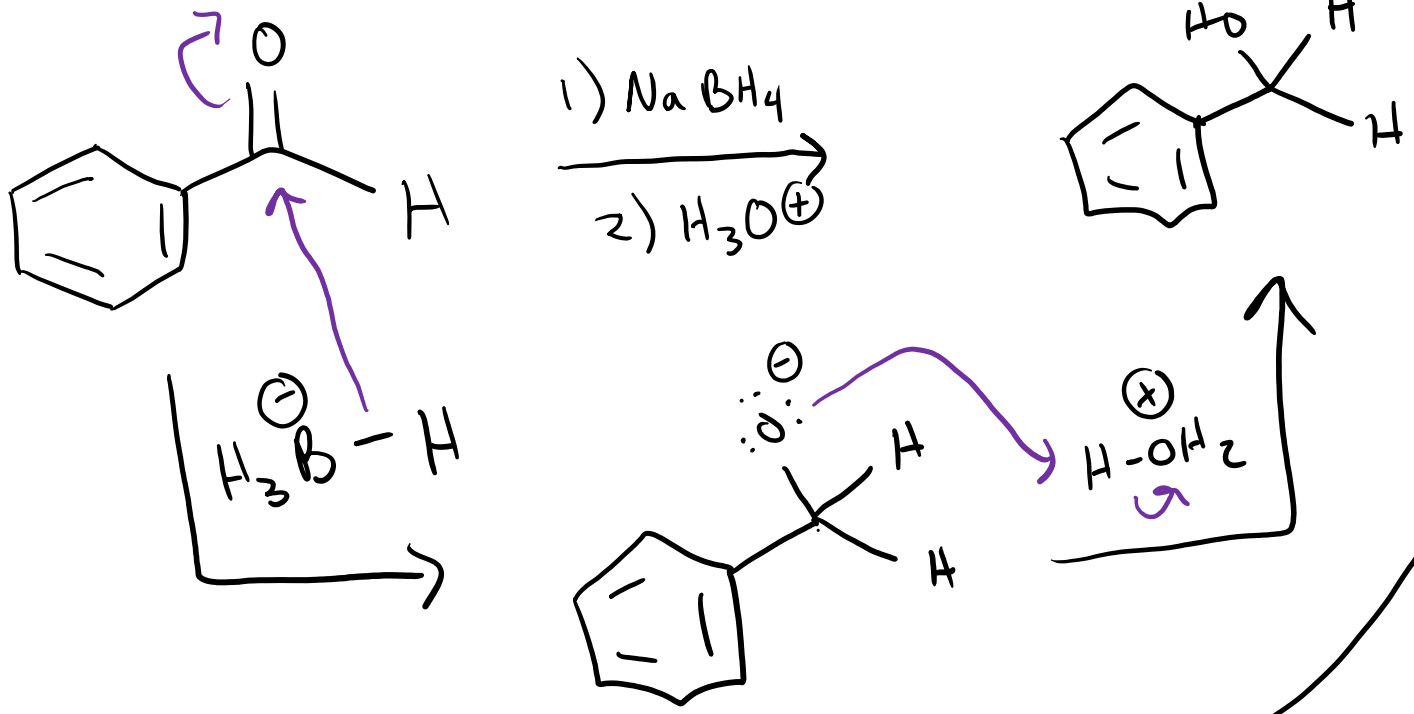


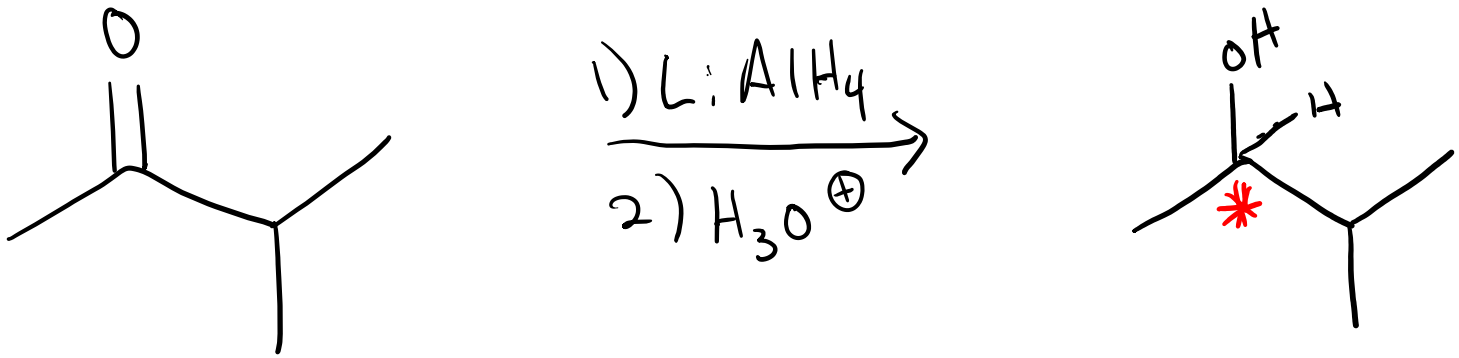
must be 1) then 2). otherwise $H_3O^{\oplus}$ will react with $H:^{\ominus}$ to give $H_2(g)$



✱ useful for synthesis ✱

Hydrogen Nucleophiles: Mechanism and Stereochemistry





new chiral center

racemic – not stereospecific reaction.

Carbon Nucleophiles: Alkyllithium and Grignard Reagents

"$R:^{\ominus}$ $Li^{\oplus}$"

$R-Li$

alkyl lithium

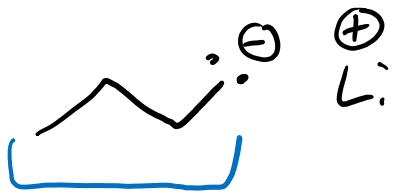
"$R:^{\ominus}$ $MgBr^{\oplus}$"

$R-MgBr$

"Grignard reagent"

$Li^{0}_{(s)}$

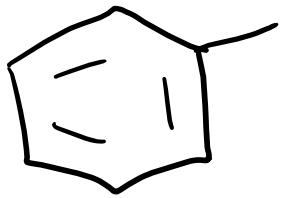
acts like



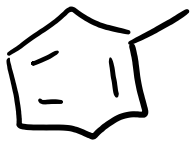
extremely strong base + nucleophile

reacts anhydrous conditions

pka ~ 50



$Mg^{0}_{(s)}$



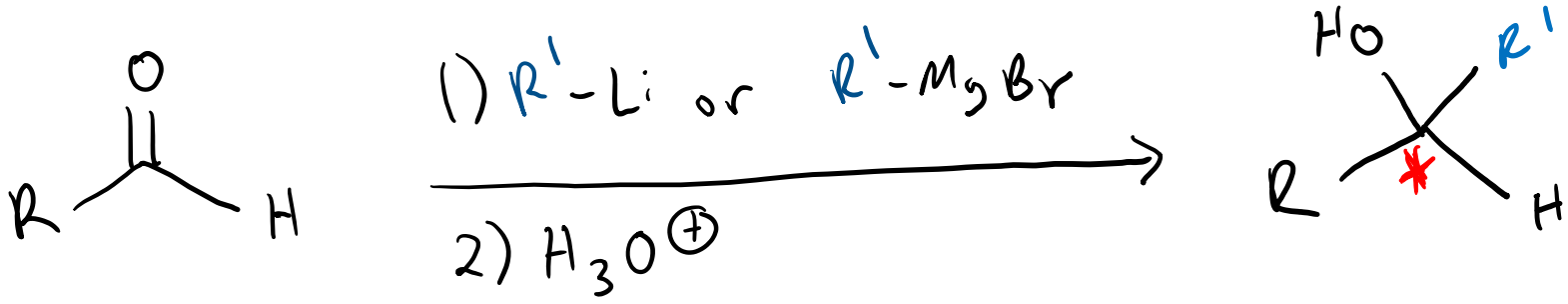
$Mg-Br$

Grignard

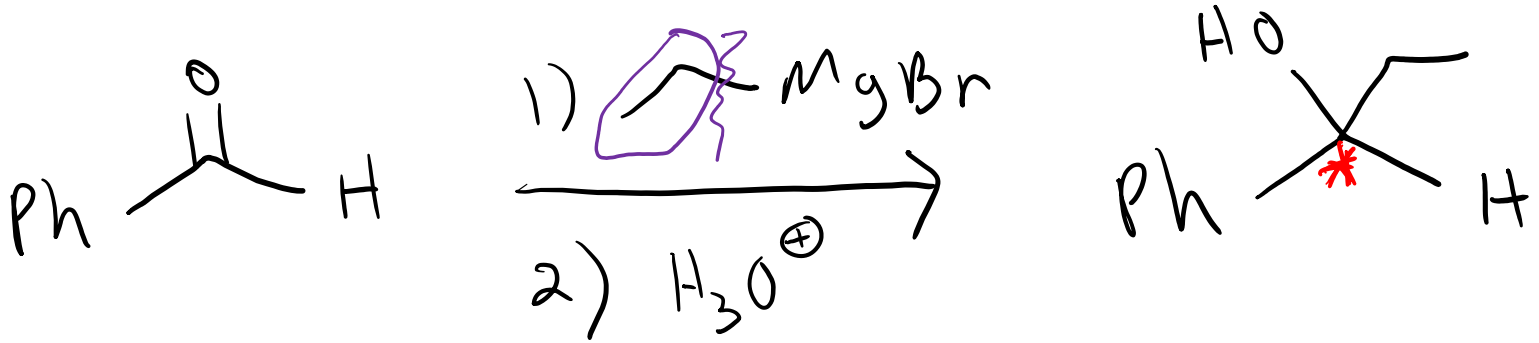
acts like

$MgBr^{\oplus}$

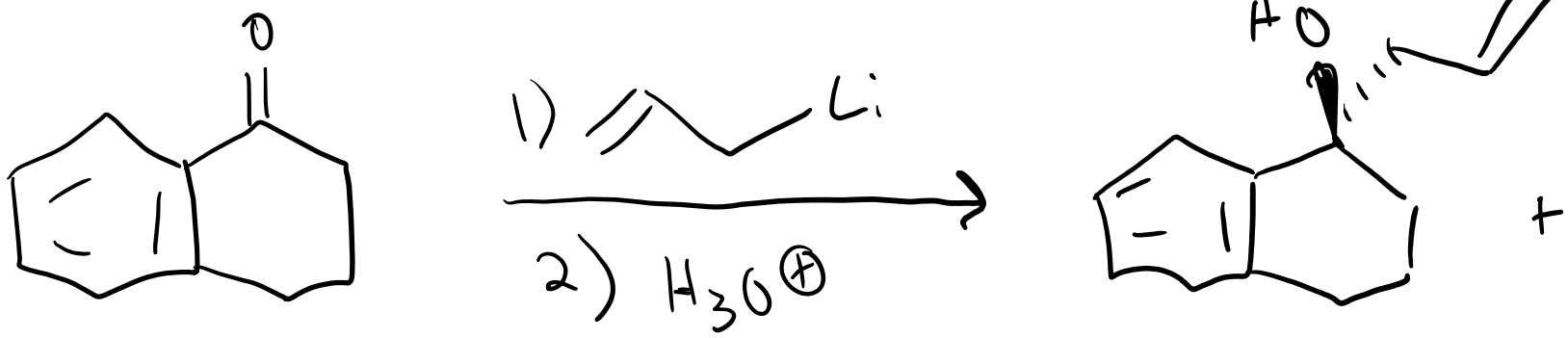
Carbon Nucleophiles



(racemic)

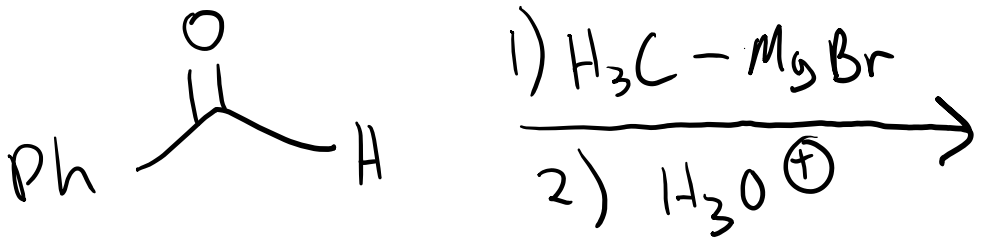


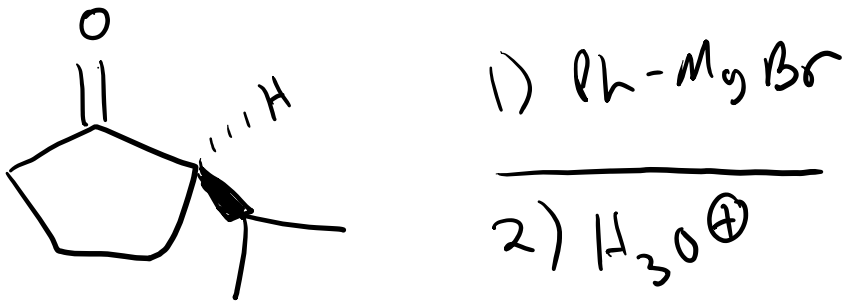
you must indicate stereochem in some way when new chiral center forms!



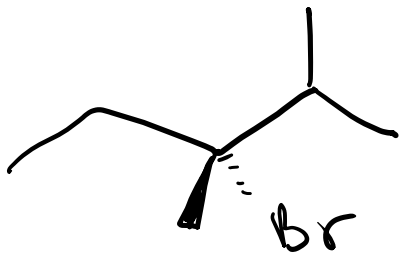
+ enantiomer

Carbon Nucleophiles: Mechanism and Stereochemistry





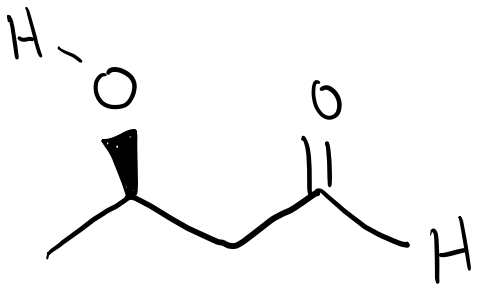
Carbon Nucleophiles: Other Notes



$Mg^{\circ}_{(s)}$ →

1) O=C=O

2) $H_3O^{\oplus}$ →



H_3CLi →