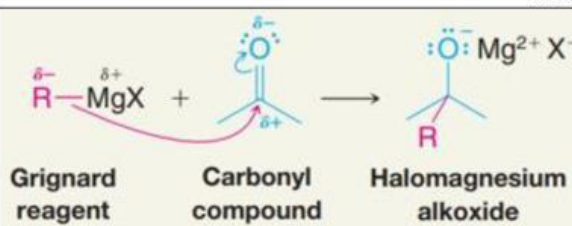
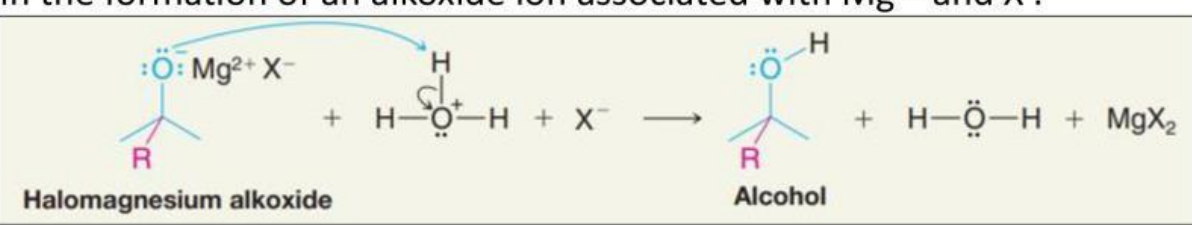
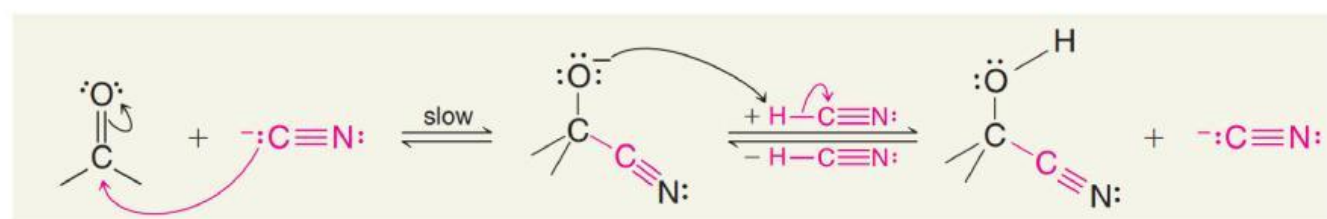


Fill in the blanks:

Grignard Reagent Mechanism

Step	Mechanism
Step 1	 Grignard reagent + Carbonyl compound → Halomagnesium alkoxide The strongly <i>electrophilic/nucleophilic</i> Grignard reagent uses the electron pair to form a bond to the carbon atom. One electron pair of the carbonyl group shifts out to the <i>carbon/oxygen</i>. This reaction is a <i>electrophilic/nucleophilic</i> addition to the carbonyl group, and it results in the formation of an alkoxide ion associated with Mg^{2+} and X^-.
Step 2	 Halomagnesium alkoxide + $H-O-H + X^- \rightarrow$ Alcohol + $H-O-H + MgX_2$ In the second step, the addition of aqueous HX causes <i>protonation/deprotonation</i> of the alkoxide ion; this leads to the formation of the alcohol and MgX_2.

Reaction mechanism of Carbonyl with Cyanide ion to form Cyanohydrin.



Cyanide ion as a/an *electrophile/nucleophile* uses the electron pair to form a bond to the carbonyl carbon atom.

Deprotonation/Protonation of the alkoxide ion by HCN forming cyanohydrin.