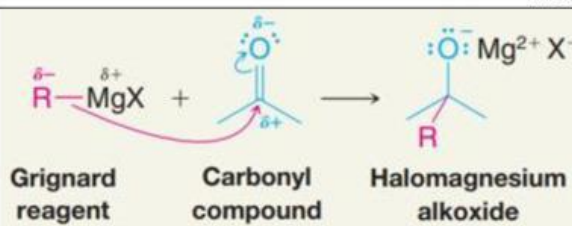
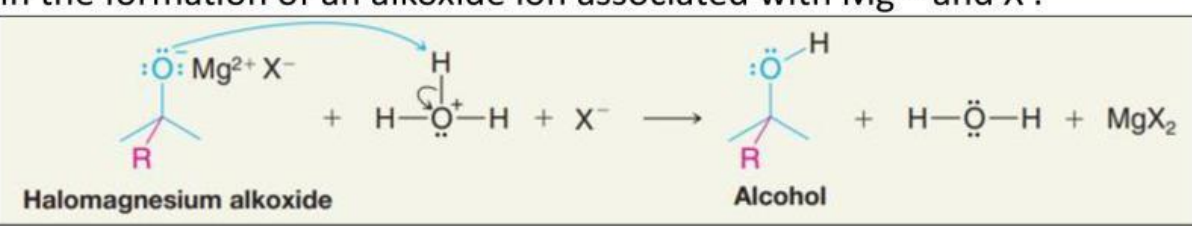
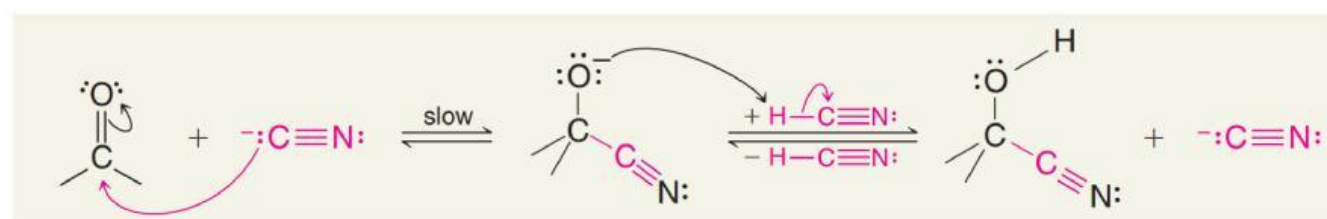


Fill in the blanks:

### Grignard Reagent Mechanism

Step	Mechanism
Step 1	 <p>Grignard reagent + Carbonyl compound → Halomagnesium alkoxide</p> <p>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 <math>Mg^{2+}</math> and <math>X^-</math>.</p>
Step 2	 <p>Halomagnesium alkoxide + <math>H-O-H + X^- \rightarrow</math> Alcohol + <math>H-O-H + MgX_2</math></p> <p>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 <math>MgX_2</math>.</p>

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.