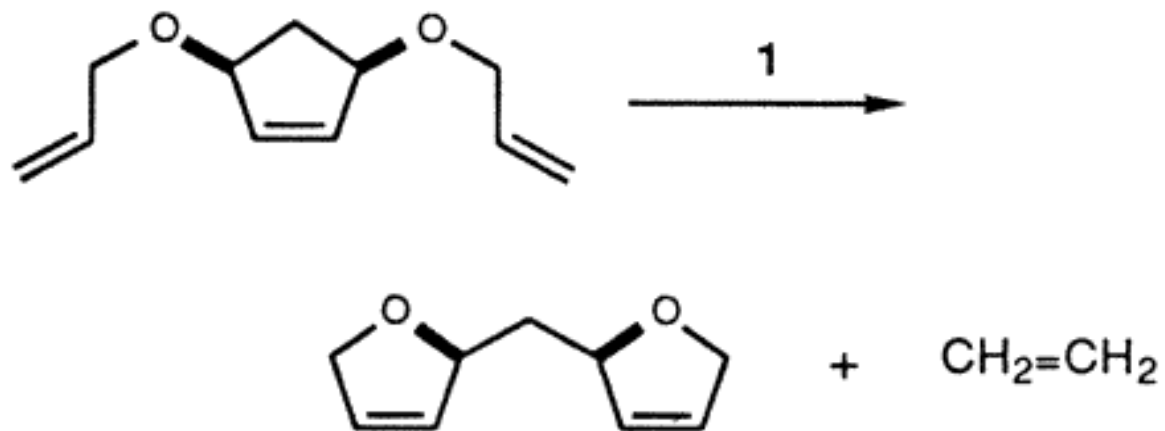
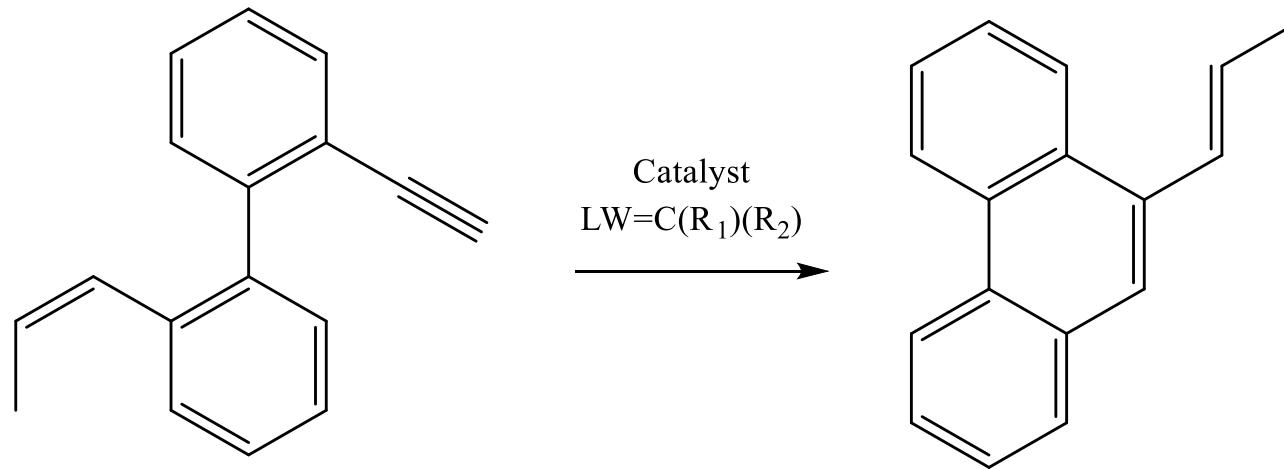


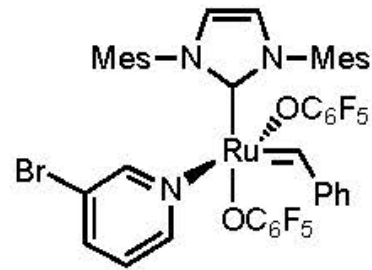
1. The following reaction was catalyzed by Grubbs-I catalysts ($L_nRu=CHPh$). Please propose a mechanism for this reaction.



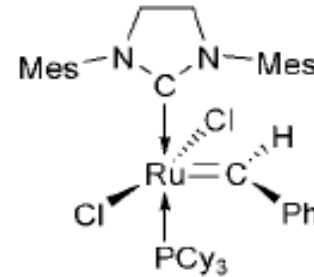
2. Enyne metathesis is a metathesis reaction between an alkene and an alkyne. Mechanistically it is similar to alkene metathesis. Please draw the mechanism of the following enyne metathesis.



3. The following Ru catalyst (Ru-a) was found to be more active than the Grubbs II catalyst in ring-closing metathesis. Explain why.



Ru-a



Grubbs II