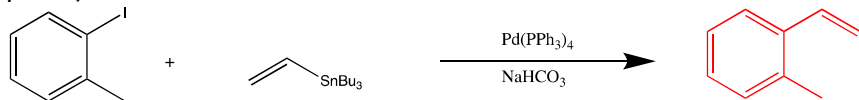
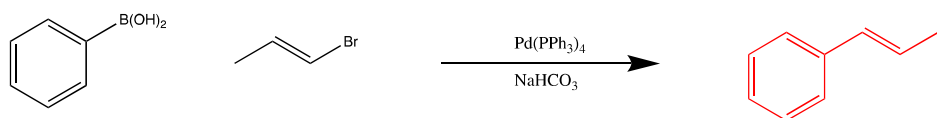


1. Provide the product for the following palladium catalyzed coupling reaction. Then circle the correct name of these particular cross coupling reaction (4 points; 2 point):



Stille Coupling Negishi Coupling

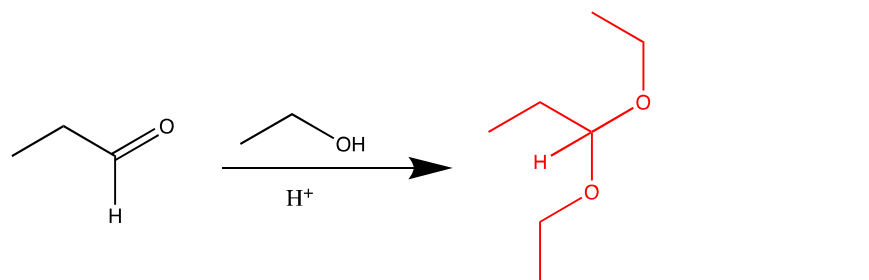
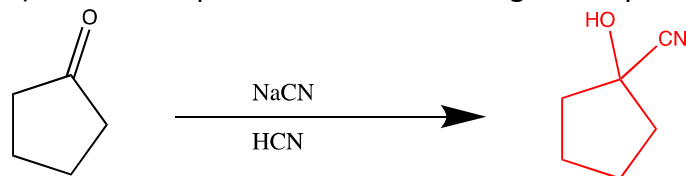
Suzuki Coupling



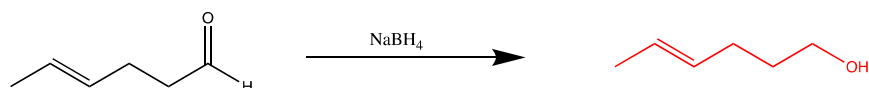
Stille Coupling Negishi Coupling

Suzuki Coupling

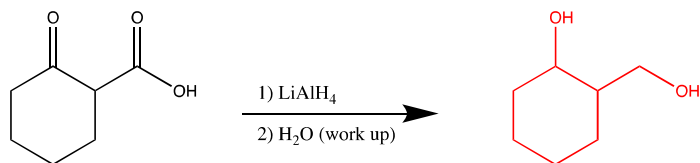
2) Provide the products to the following carbonyl based reactions (6 points) (2 point each):



1 point for hemiacetal product

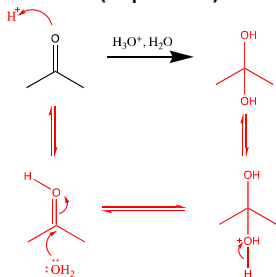


-1 point for reduction of double bond



-1 point for only one carbonyl reduction

3) Provide the arrow pushing mechanism for the following acid catalyzed gem diol formation (6 points):



2 points per intermediate
2 points for correct arrow pushing
2 points for correct product