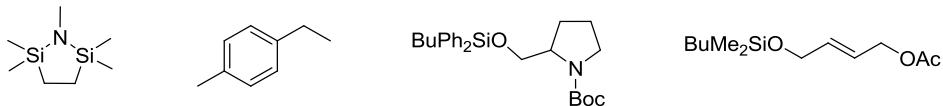


Spivey Group Problem Session – May 2011

C-H Activation

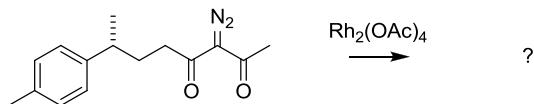
Set by Sarah Warren

1. The following molecules undergo selective C-H functionalisation with metal carbenoid reagents.

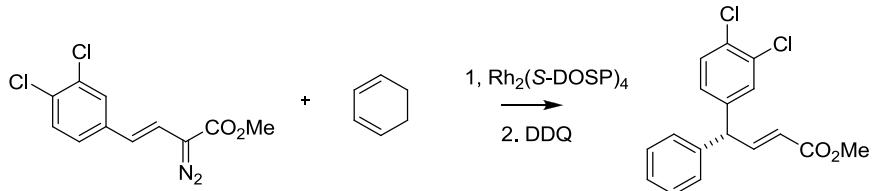


Predict at which position functionalisation occurs in the above molecules

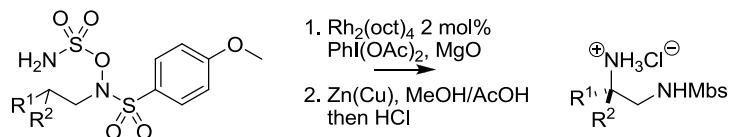
2. Predict the product in the following scheme and propose a mechanism for its formation.



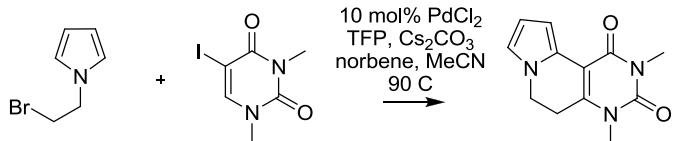
3. The transformation shown below is a useful method for the synthesis of chiral molecules with two sterically similar aryl groups. Provide a mechanism for the formation of the product.



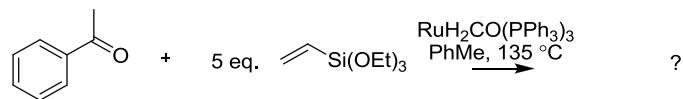
4. Propose a synthesis of the starting material and provide a mechanism for the formation of the product in the transformation shown below.



5. Propose a mechanism for the following transformation.



6. Heteroatoms can be used to direct C-H activation. Predict the outcome of the following reaction and provide a mechanism.



7. Norbene can be used as a tether/directing group for C-H insertion. Provide a mechanism for the following transformation which starts with oxidative addition followed by a Heck reaction.

