Microwave Mediated Suzuki Coupling using PEPPSI-iPr

Questions to Answer in the Text of Your Report in Addition to the Usual Stuff

Note: These all count towards your grade, so if you ignore them, your score will suffer. Better reports will incorporate these questions naturally into the introduction and discussion instead of just throwing them in randomly.

1. What are the tenets of green chemistry? How well does your catalytic reaction fit that definition?

2. What are N-heterocyclic carbenes and what are they good for?

3. What is Suzuki coupling? What is its mechanism (draw it)? Cite one research paper that uses Suzuki coupling.

4. What are oxidative addition, transmetalation, and reductive elimination? Identify these processes in your Suzuki coupling mechanism.

5. What are some other catalysts that have been used for Suzuki coupling (cite your sources)?

6. 3-chloropyridine costs about $2/gram. Pyridine costs about 20¢/gram. Why do we bother using 3-chloropyridine instead of the much cheaper pyridine to make PEPPSI?

7. What are turnover number and turnover frequency?

8. What is the difference between % conversion and % yield? What do the two values tell you about the reaction?

9. Using the data from the reaction time optimization studies, determine the turnover frequency of PEPPSI under your reaction conditions.

10. What is the best solvent/additive for this reaction?

11. What is the best base for this reaction? What is the purpose of the base in Suzuki coupling?

12. Construct a table of % yield values for each Suzuki reaction done by the class. Make sure it is organized enough that anyone can figure out all the reaction conditions of each reaction at a glance.