

## Paper #2

## "The Preparation and Reactivity of Grignard Reagents"

Chem 228/WS2008

(50 pts, due week of 4/23(24)/08)

The last step in this semester's synthesis project is a Grignard reaction between benzylmagnesium chloride and acetone to produce the final floral fragrance alcohol, 2-benzyl-2-propanol. Your paper should review the general preparation and reactivity of Grignard reagents.

Library sources listed below, will be consulted for information about the Grignard reaction to be performed in the synthesis project portion of lab. The written paper should be no more than 5 pages typewritten, 12 pt. times new roman, double spaced, both left and right justified. Standard tense is 3<sup>rd</sup> person. An abstract of no more than 100 words should summarize the paper.

Note that providing a literature reference is not license to quote the source verbatim. That is plagiarism. You should restate in your own words. You should briefly cover all of the following

### Topics to be covered must include

Brief history of the Grignard reagent (discovery, first publication, (ref))

mechanism of the reaction with aldehydes and ketones,

initiation: methods for starting the reaction,

suitable solvents and any effects on rate, yield,

effect of order and rate of reagent addition,

reactivity vs structure in the formation of Grignard reagent (effects on rate of formation)

halogen (Cl vs Br vs I),

alkyl vs aryl,

steric effects

aryl substituent effects (substituents on aromatic rings),

incompatible functional groups (cannot be present on the same molecule),

common side reactions (and methods to minimize them)

stability of Grignard reagents (storage conditions, what to avoid contact with)

### **Suggested References: (books are on reserve for chem. 228, except for ref. encyclopedia)**

Kharasch & Reinmuth, "*Grignard Reactions of Nonmetallic Substances*"

QD 77.K46

V. Migrdichian, "*Organic Synthesis*", v. 1, chapt. 12, p. 543-622

QD 262.M63 v.1

I. Omae, "*Applications of Organometallic Compounds*", p. 49-72

QD 411.0525

H. Mark (ed), "*Grignard Reactions*" in *Ency. of Chem. Technol.*, v.12

Ref.TP9.E685

General organic textbooks

If any other sources are used, they should be cited in proper bibliographic format