Chemistry 140B
Whitesell
Spring Quarter, 2013
First Midterm Exam, Monday April 29, 2013

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Your answers to this exam are to be only your own work. You may use no written or electronic information during this test period other than the five pages of this exam. You may not use the back of any pages for answers. Up to one week (exactly 168 hours) after your exam is returned you may submit it for regrading if and only if you have made NO marks on the exam except for a star (*) ON THIS PAGE next to the number(s) of the question(s) you would like regarded and your signature(s) and check(s) below. You must place your exam in the drop box on the sixth floor of PAC Hall.

your signature (read the above before signing)

To request regrading, sign below and check the appropriate box(es).

your signature
I would like the questions marked with a star (*) regraded (check box at right)
If you feel that we have made an addition error in your score, check the box at the right
If we have recorded your grade on TED in error, check the box at the right
1.

a) Indicate the correct order of acidity for the following compounds, most acidic to the left. (3pts, no partial credit.)

Ethane
Acetic acid
Methanol

b) Order the following compounds based on the chemical shift of the methylene groups, most upfield to the right. (3pts, no partial credit.)

CH₃CH₂NH₂
CH₃CH₂CH₃
CH₃CH₂OH

CH₃CH₂OH | CH₃CH₂NH₂ | CH₃CH₂CH₃

C) Order the following compounds based on boiling point, the highest to the right. (3pts, no partial credit.)

CH₃CH₂OH
CH₃OCH₃
CH₃CH₂NH₂

CH₃OCH₃ | CH₃CH₂NH₂ | CH₃CH₂OH

d) Indicate the number of unique methyl groups present in each of the following (1pt each):

![Methyl groups]

Your signature (in ink) ___________________________________________ 2
2. Provide a synthetic pathway that could be used to make the compound shown below from any combination of inorganic reagents and any combination of organic compounds so long as none has more than two carbon atoms. Your answer must fit entirely within the box.

3. Provide a complete mechanism including curved arrows showing the flow of all electrons for the following reaction. Your answer must fit within the box provided.
4. Provide the expected major organic product from for the following reactions that have a box at the right. Provide a starting material that will be transformed to the given product when there is a box at the left. Provide reagents that will effect the shown transformation when there is a box over the arrow. Do not show stereochemistry. You must place your answer in the box provided. Answers outside the boxes will not receive credit.
5. The proton nmr spectrum shown below was obtained on a compound with the formula: C₆H₁₄O. Provide a structure *in the box* provided that is consistent with the spectrum.