**CHM 1321 – Problem set 7**

**In this set:**

* Nucleophilic addition to carbonyls and other pi bond electrophiles
* Acid/base chemistry

1. Name the following compounds



1. Draw the structure corresponding to the following names:
   1. (*E*)-2-butenal
   2. 2-ethenylcyclohexanone
   3. 4-oxohexanal
   4. the benzyl carbocation
   5. 1-phenylethanone (acetophenone)
2. Can Grignard reactions be conducted in protic solvents? Explain.
3. How could you synthesize the following deuterium-labeled compound from:
   1. Benzene?
   2. Bromobenzene?

Note: D2O is readily available. D = 2H, an isotope of 1H



1. Give the product of each of the following reactions:



1. Provide a mechanism for the first step in each of the following reactions:



1. Draw one set of starting materials (electrophile and nucleophile) for each of the following products (assume aqueous workshop)::



1. Give the mechanism and products. State the isomeric relationship between products, if applicable.

