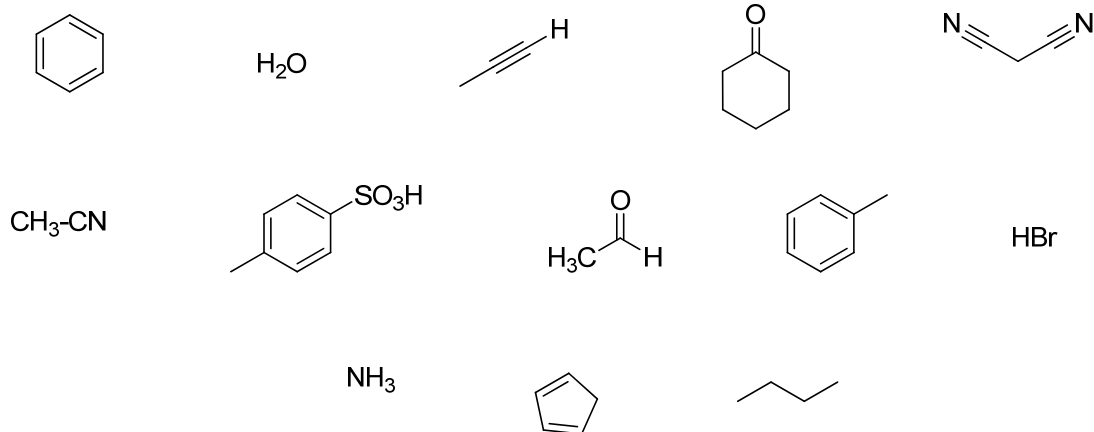


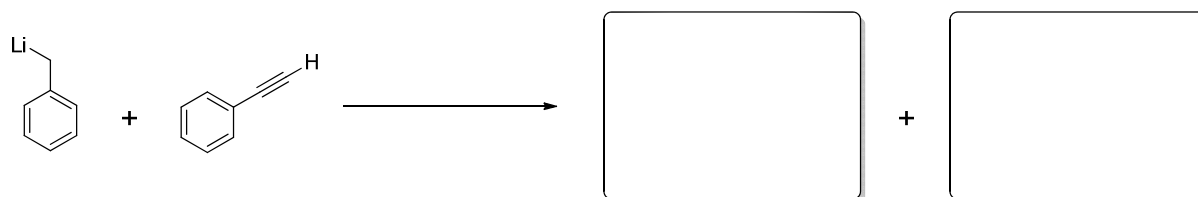


Problem Set No. 1

1. Sort the following compounds according to their pK_a-values:



2. Provide the products and calculate the K_{eq} for the following reaction and determine the free energy. Indicate whether the reaction is reversible or not. (see https://webspace.utexas.edu/cc1524/CH318N/pKa_Keq.pdf) and (remember $\Delta G = -RT \ln K_{eq}$).



- 3.
- Give a mechanistic description of the formation of an organolithium species from lithium metal and provide the term used to describe this process.
 - What figure of merit can be used to predict if a solvent will be compatible with *n*-BuLi. Give examples of solvents compatible and incompatible.
 - Above -20°C *n*-BuLi reacts with THF (tetrahydrofuran) provide a detailed reaction mechanism and draw all products after hydrolysis.