## Study of Nucleophilic Fluorination on Electron-Rich Aromatic Rings from Non-Aromatic Precursors

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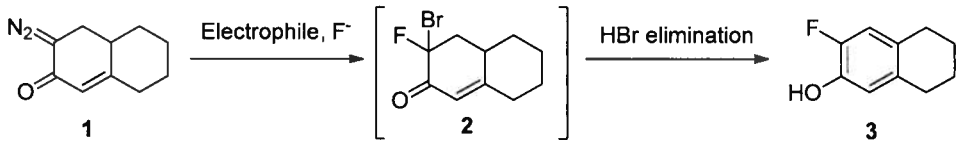
There are essentially no reliable and practical methods for electron-rich aromatic rings, such as phenols, to be labeled with F-18 at high specific activity. The requirement for high specific activity means that the fluoride labeling reagent is limited to F-18 fluoride ion, and the electron-poor precursor arenes needed for efficient nucleophilic aromatic substitution require further steps to be converted into phenols after F-18 labeling. It is the objective of this project to develop and optimize a series of unusual synthetic transformations that will enable phenols (and other electron-rich aromatic systems) to be labeled with F-18 at high specific activity, rapidly, reliably and conveniently. We have conceived of a diazo compound as a precursor from which it should be possible to prepare F-18 labeled phenols conveniently by halofluorination of a diazo group followed by elimination. The α-diazoketone (**1**) was treated with an electrophile, in the presence of an appropriate fluoride source to give **2**. Elimination of hydrobromide afforded the desired *ortho*-fluorophenol (**3**) in moderate yield and within 35 minutes reaction time for two steps, which is consistent with the 110 minute half life of F-18.




**1** **2** **3**