SYNTHESIS OF A FERROCENE-BASED 1,4,5,6-TETRAHYDROPYRIDAZINES

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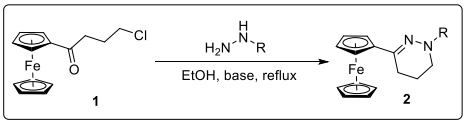
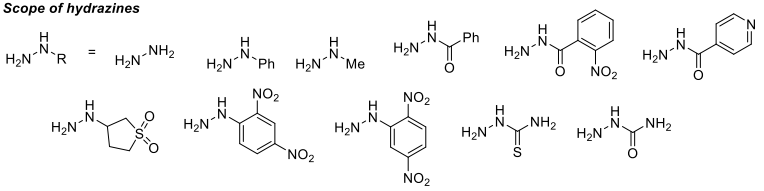
Since its discovery, more than 70 years ago, ferrocene has played a prominent role in nearly all aspects of synthetic chemistry from materials science to medicinal chemistry. Due to the unique properties of ferrocene and its derivatives, ferrocenyl compounds are unsurprisingly considered privileged structures in asymmetric catalysis, synthesis of biologically active compounds and components for organoelectronics.

We turn our attention on γ-chloro ketone **1**, easily available from ferrocene *via* Friedel-Crafts acylation, as a convenient synthon for synthesis of biologically relevant azaheterocycles. After some optimization attempts, we have recently found that ketone **1** can react with hydrazine hydrate and its analogues to give tetrahydropyridazines **2** in good yields. We plan to expand the scope of such products using the hydrazine derivatives shown below.



Scope of hydrazines



Next, we plan to investigate various [3+2]-cycloadditions of tetrahydropyridazines **2** with donor-acceptor cyclopropanes and N-benzyl-1-methoxy-N-((trimethylsilyl)methyl)-methanamine. These reactions are expected to give five-membered azaheterocycles − octahydropyrrolo[1,2-*b*]pyridazines **3** and octahydroimidazo[1,5-*b*]pyridazines **4**.