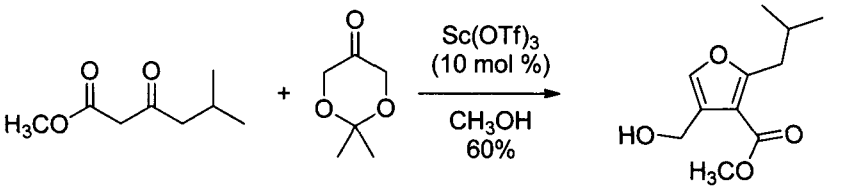
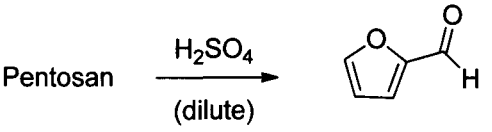
Lewis acids have also been used to synthesize highly functionalized furan derivatives with biological signalling capabilities. For example, Sello and co-workers used scandium(III) triflate in their biomimetic synthesis of several signalling molecules of the bacterium *Streptomyces*.[57] Reaction of methyl 5-methyl-3-oxohexanoate and 2,2-dimethyl-1,3-dioxan-5-one in the presence of scandium (III) triflate in methanol gave the corresponding furan in 60% yield.



Synthesis of Furans from Carbohydrates

Carbohydrates have been used as chirons to generate a number of interesting furan derivatives from industrial commodities such as 2-furaldehyde, to more complex, biologically significant compounds with therapeutic potential. Several interesting examples of the use of carbohydrates as starting materials for the synthesis of furans are highlighted below.

2-Furaldehyde, an important intermediate in the synthesis of a number of natural products and pharmaceutical reagents, is prepared industrially by treating plant residues rich in pentoses (pentosan) with dilute sulphuric acid. Steam distillation is then used to obtain 2-furaldehyde as a pure substance for further functionalization.



Marcantoni and co-workers[58] used glucose as a chiron in the silica-supported Knoevenagel condensation of aldose sugars with β-dicarbonyl compounds (the Garcia–Gonzalez reaction) to produce 2,3,5-trisubstituted furan derivatives for use as scaffolds in the synthesis of biologically active compounds. Treatment of a mixture of α- and β-glucose with cerium(III) chloride hepta-hydrate and sodium iodide in the presence of silica produced the desired furan in high yield.