CHAPTER OVERVIEW

5: Acetals & Ethers

I. Introduction

Acetals are pervasive in carbohydrate chemistry. They link together saccharide units in oligo- and polysaccharides, provide the bonding in glycosides that joins carbohydrate and aglycon portions of a molecule, and furnish protection for hydroxyl groups during synthetic transformations. Because acetals have these vital protective and connective roles, their stability in the presence of free radicals is critical in enabling radical reactions selectively to modify other parts of a carbohydrate structure. Even though most acetals are stable in the presence of the carbon-centered radicals typically encountered in carbohydrate chemistry, there are reactions between heteroatom-centered radicals and acetals that are useful in carbohydrate transformation.

Ethers also serve as hydroxyl protecting groups during carbohydrate synthesis because, like acetals, they are unreactive in the presence of most carbon-centered radicals. When reaction of an ether or acetal does occur, it typically is hydrogen-atom abstraction from a carbon atom that has an attached oxygen atom.

Topic hierarchy