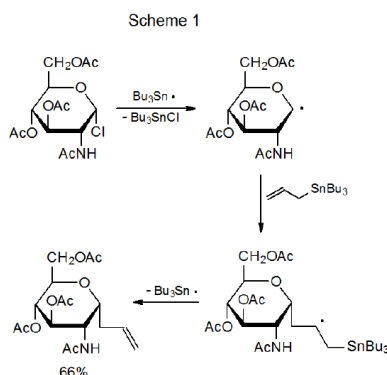


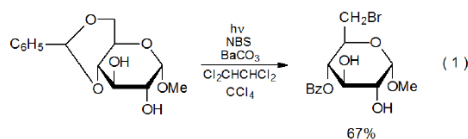
I. Introduction

Halogen-atom abstraction to give a carbon-centered radical is the first step in many radical reactions. Among the more common of these are simple reduction, radical addition, and radical cyclization. A typical example is given in Scheme 1, where chlorine-atom abstraction produces a pyranos-1-yl radical that then adds to the carbon-carbon double bond in allyltri-*n*-butyltin.¹ Group migration, ring-opening, elimination, hydrogen-atom abstraction, and radical combination are less common reactions that also often begin with halogen-atom abstraction that forms a carbohydrate radical.



Another way of viewing reactions that begin with halogen-atom abstraction is one taken from the perspective of the involvement of such reactions in carbohydrate synthesis. This view describes these reactions in terms of the changes in carbohydrate structure that they make possible; thus, halogen-atom abstraction is involved in synthesizing deoxygenated sugars and nucleosides, establishing glycosidic linkages, extending carbon-atom chains, forming new ring systems, introducing unsaturation, and modifying protecting group reactivity. This broad range of applications combines with generally good product yields to make halogen-atom abstraction the first step in many, useful synthetic reactions.

In addition to the variety of reactions that begin with loss of a halogen atom, there are others that reverse this process; that is, there are reactions that cause a halogen atom to be incorporated into a carbohydrate. The range of synthetically useful compounds prepared in this way is limited. Radical halogenation is not part of a general synthesis of carbohydrate halides, but it sometimes provides a route to compounds that are difficult to prepare in other ways. The specialized, but useful, nature of radical halogenation is illustrated by the conversion of a 4,6-*O*-benzylidene acetal into the corresponding bromodeoxy benzoate (eq 1).²



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