Allyl Functional Group Encyclopedia Article

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Contents

Allyl Functional Group Encyclopedia Article.....1

Contents.....2

Allyl Functional Group.....3

Allyl Functional Group

The allyl **functional group** is CH_2=$CHCH_2$ with a double bond being present between the first and second **carbon** atoms. The International Union of Pure and Applied **Chemistry** (IUPAC) name for the allyl group is the propenyl group. The name allyl comes from the scientific name for garlic, *Allium*. Garlic contains a number of allyl-containing molecules, notably allyl **alcohol** (CH_2=$CHCH_2OH$) and diallyl disulfide (CH_2=$CHCH_2SSCH_2$ $CH=_2$ (that gives garlic its characteristic odor).

One of the most important uses of allyls is in the manufacture of various **plastics**. After polymerisation using **heat**, light, radiation, or catalysis a range of strong thermosetting plastics can be produced. Compounds that are made from polymerization of the allyl functional group are used as plastics, adhesives, furniture finishes and they can also have flame retardant properties. Some possess such good resistance to chemical and abrasive attack that they are used for the manufacture of plastic eyeglass lenses.

The most important **reactivity** of this group is its ability to impart reactivity to the carbon of the allyl immediately adjacent to the alkene double bond. The biosynthesis of many important primary metabolites (such as cholesterol) proceed through intermediates that contain the allyl alcohol functional group. This allyl alcohol is activated by phosphorylation to give a reactive allyl **cation** that is used to build up more complex structures. Allyl halides, such as allyl bromide (CH_2=$CHCH_2Br$), are used extensively in organic synthesis for their ability to transfer easily the allyl group to nucleophilic atoms.