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Organic Chemistry: Current Research

Editorial

Editorial Note on Alpha Carbon Chemistry

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EDITORIAL

In an organic compound, an alpha (symbol) carbon is a carbon atom bound to a functional group; the carbon atom next to the alpha (symbol) carbon is the beta (symbol) carbon, and so on. There may be more than one carbon in a compound with only one functional group.

Amino acids are named after the alpha carbon (-carbon or C) that binds the amino group to the acid carboxyl group. The alpha carbon also acts as a connector for the sidechains of 19 of the 20 amino acids used in protein synthesis. The amino acid glycine is the only one without a sidechain.

Making it through the chemistry of carbonyl derivatives (ketones, aldehydes, carboxylic acids, esters, and more) involves at least two "weird" nomenclature issues: Greek letters and "1,2-" or "1,4-" addition reactions. I'll try to answer both of them in this article.

A "carbonyl" is a functional group with the formula C=O. The carbon is referred to as "carbonyl carbon," and the oxygen is referred to as "carbonyl oxygen." But what do you call a carbon that is adjacent to a carbonyl carbon... or a carbon that is three carbons away?

Greek letters are commonly used in organic chemistry to represent this. So a carbonyl's neighboring carbon is called a "(alpha) carbon," a carbon two carbons away is called a "carbon," and so on.

It's popular to name anything "-unsaturated" if it has a double bond between the carbon and the carbon. As a result, unsaturated ketones, aldehydes, esters, and other compounds are possible of course, it can go beyond gamma, but it's uncommon to see it go beyond that (epsilon).

Another difference is that aldehydes, esters, carboxylic acids, and other similar compounds can only have one “alpha” carbon, while ketones can have two. To differentiate one set of Greek symbols from another, you can see ‘(prime) symbols. The prime's position is totally random.

The OR category is not referred to as "alpha" in esters. It's commonly referred to as the "alkoxy" category.

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