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SuFEx-Enabled Cyclodextrin Functionalization and Connection: Click-II Chemistry utilized for Innovative Cyclodextrin Modifications

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Click chemistry is a conceptual framework for functional molecular assembly, emphasizing a modular approach of selective reactions for the rapid synthesis of useful new compounds in search of function. Copper(I)-catalyzed azide–alkyne cycloaddition[1] (CuAAC) and sulfur(VI) fluoride exchange[2] (SuFEx) are often referred to as Click-I and Click-II, respectively, by Prof. Sharpless and co-workers. Over the past decade, SuFEx reactions have illuminated some of the unique advantages of click chemistry, including facile assembly of versatile small-molecule libraries and rapid entry to novel families of intriguing materials[2,3]. While CuAAC click chemistry is being extensively utilized in numerous emerging areas of glycoscience[4], the application of SuFEx click reactions in the field of carbohydrate and cyclodextrin (CD) chemistry has so far remained underexplored[5,6]. Here we present for the first time innovative CD modifications enabled by SuFEx click chemistry. After equipped with appropriate SuFEx hubs, the resulting CD–SuFEx intermediates can click with a broad spectrum of commonplace building blocks, thus handily introducing a wide range of desired functionalities, and drastically increasing accessible chemical space.

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