



COOPERATIVE CAPTURE FOR THE SYNTHESIS OF MECHANICALLY INTERLOCKED MOLECULES AND POLYMERS

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Cu-catalyzed click chemistry has been widely applied to a variety of chemistry related disciplines. Cu free click chemistry, which eliminates the use of cytotoxic Cu(I) catalyst, has been developed with incredible bioorthogonality. Recently, we discovered that the cucurbit[6]uril (CB) catalyzed alkyne-azide cycloaddition (AAC) can be accelerated in the presence of cyclodextrin via the formation of cooperative hydrogen bonding network. This strategy, which benefits considerably from positive cooperativity, has been further applied to the synthesis of rotaxanes and polyrotaxanes. We also discovered that pillar[5]arene (P) can interact with cucurbit[6]uril to promote the efficient cooperative capture of oligorotaxanes, and the observation that this particular combination is tolerant to variation in the length of the azide guest. This new strategy of using macrocyclic molecules to catalyze the AAC reaction is another Cu-free click chemistry for the synthesis of mechanically interlocked molecules and polymers.

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