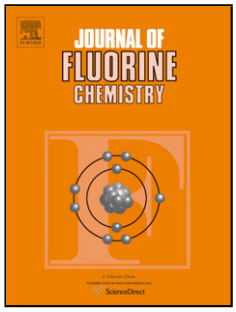

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Highly regioselective cobalt-catalyzed [2+2+2] cycloaddition of fluorine-containing internal alkynes to construct various fluoroalkylated benzene derivatives

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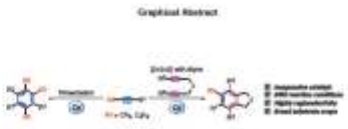
Graphical abstract



Highlight

1. Cobalt-catalyzed [2+2+2] cycloaddition using fluorine-containing alkynes proceeded under mild reaction conditions.
2. The reaction can be performed at low catalyst loading.
3. High regioselection was observed in the trimerization of fluorine-containing alkynes.
4. Cycloaddition of fluorinated alkynes with non-fluorinated diynes proceeded very smoothly.

Abstract: Novel cobalt-catalyzed [2+2+2] cycloaddition using fluorine-containing alkynes was described. Cyclotrimerization of fluorinated alkynes under the influence of $CoCl_2$(dppb) in acetonitrile at 80 °C for 3 h took place smoothly, affording the corresponding benzene derivatives in excellent yields with high regioselectivity. Additionally, intermolecular cycloaddition of fluorinated alkynes with non-fluorinated diynes also proceeded in the presence of a catalytic amount of $CoCl_2$((*S*)-BINAP) and ZnI_2 to give various bicyclic aromatic compounds in high yields.