

Rapid Synthesis Using Fluorous Tag

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A fluorous solvent such as perfluorohexane is insoluble in most organic solvents and water, and three layers are formed. A highly fluorinated (fluorous) compound exhibits a high solubility for fluorous solvents, and is readily separated from non-fluorinated compounds by the simple fluorous-organic solvent partition. The substrate, which had the fluorous-tag, exhibits a high solubility for the fluorous solvent. After liquid-phase synthesis for the fluorous substrate, the reaction mixture is partitioned between the fluorous and organic solvents, such that the excess reagent and the product containing the fluorous-tag are extracted into the organic phase and the fluorous phase, respectively. The desired chemical structure is assembled by repetition of the above procedure. Finally, the fluorous-tag is removed to give the desired product, which can be extracted with an organic solvent. The fluorous-tag can be extracted with a fluorous solvent and is recyclable. Fluorous synthesis is an efficient synthetic method without the need for column chromatography, and is comparable to solid-phase synthesis. We report the synthesis of a simple natural oligosaccharide, such as the Gb3 oligosaccharide and galactose β (1-6) pentamer, involving the Bfp (bisfluorous chain-type propanoyl) and TfBz (trisfluorous chain-type benzoyl) groups as an aliphatic acyl-type fluorous protecting group. In addition, we also report the synthesis of oligosaccharides and peptides using fluorous supports with a high fluorine content, Hfb (hexakisfluorous chain-type butanoyl) and HfBn (hexakisfluorous chain-type benzyl) groups.