

Metathesis reaction Using Fluorous Grubbs-Hoveyda Catalyst, And Reverse Fluorous Solid Phase Extraction

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Organic molecules bearing small fluorous tags (C_6F_{13} , C_8F_{17}) are called light fluorous molecules. Light fluorous reagents, scavengers and catalysts are especially convenient since they typically induce reactions of organic substrates under the same conditions as their non-fluorous relatives, but are reliably removed from crude reaction products by fluorous solid phase extraction. Herein we report light fluorous versions of the first- and second-generation Grubbs-Hoveyda metathesis catalysts. These exhibit the expected reactivity profile, are readily recovered from reaction mixtures by fluorous solid phase extraction, and can be routinely reused five or more times. The catalysts can be used in a standalone fashion, or supported on fluorous silica gel.

Furthermore, we would like to show a new technique for the separation of fluorous-tagged molecules from organic molecules. Fluorous-tagged compounds can readily be separated from organic (non-tagged) compounds by the new separation technique of reverse fluorous solid phase extraction (R-FSPE). In a reversal of the roles of solid and liquid phases in standard fluorous SPE, a mixture is charged to a polar solid phase (standard silica gel) and then eluted with a fluorous solvent. The organic compounds of the mixture are retained, while the fluorous components pass. The technique uses expensive silica gel along with fluorous solvents that are routinely recovered and recycled. Because the fluorous products elute first, the method is especially useful when the fluorous products are the target of a given reaction.