Immobilization of Organic Functional Groups onto Silica

Selected examples:

- 3a: 92% yield 4a: 0.90 mmol/g
- 3b: 70% yield 4b: 1.04 mmol/g
- 3c: 63% yield 4c: 0.64 mmol/g
- 3d: 81% yield 4d: 0.88 mmol/g
- 3e: 65% yield 4e: 0.94 mmol/g
- 3f: 77% yield 4f: 0.94 mmol/g
- 3g: 78% yield 4g: 0.87 mmol/g

Preparation of the dansyl group functionalized silica:

Surface modification of glass slides:

Significance: Functionalized vinylsilanes were prepared by hydroacylation of dimethylvinylsilane with various aldehydes in the presence of (Ph3P)3RhCl, 2-amino-3-picoline, and 4-(trifluoromethyl)benzoic acid (63–92% yield, 11 examples). Immobilization of onto silica by using [IrCl(coe)2]2 and DMA·HCl gave the corresponding functionalized silica compounds with 0.58–1.04 mmol/g of loading (11 examples).

Comment: The silica-immobilization method has been developed by the same authors (Org. Lett. 2007, 9, 4073). Surface modification of hydrophilic glass slides with vinylsilanes gave the significantly hydrophobic glass slides as estimated from contact angle measurements.

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