Immobilization of Organic Functional Groups onto Silica

**Significance:** Functionalized vinylsilanes were prepared by hydroacylation of dimethyldivinylsilane (2) with various aldehydes 1 in the presence of (Ph₃P)₂RhCl, 2-amino-3-picoline, and 4-(trifluoromethyl)benzoic acid (63–92% yield, 11 examples). Immobilization of 3 onto silica by using [IrCl(coe)₂]₂ and DMA·HCl gave the corresponding functionalized silica compounds 4 with 0.58–1.04 mmol/g of loading (11 examples).

**Comment:** The silica-immobilization method ([IrCl(coe)₂]₂; DMA·HCl) 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.

**Selected examples:**

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

**Preparation of the dansyl group functionalized silica:**

- **3d**
- **3e**
- **3f**
- **3g**

**Surface modification of glass slides:**

- **3e (R = n-C₃H₇)**
- **3f (R = n-C₆H₁₃)**
- **3g (R = n-C₉H₁₉)**

**Contact angle of water:**

- **3e:** 7°
- **3f:** 71°
- **3g:** 94°