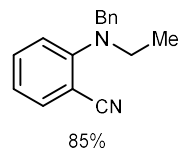
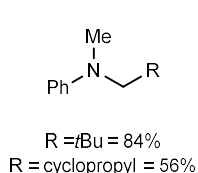
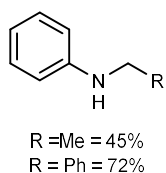
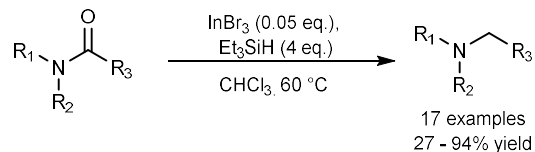


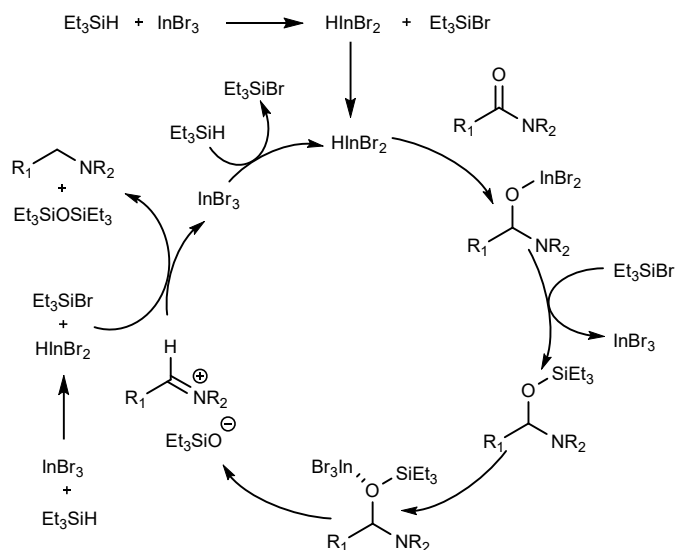
Examples in Synthesis:

Fuchs, J. R. *Bioorg. & Med. Chem.* **2018**, *26*, 2354. <https://doi.org/10.1016/j.bmc.2018.03.033>
 Tang, R., Qin, Y. *Nat. Prod. Biorespect.* **2015**, *5*, 255. <https://doi.org/10.1007/s13659-015-0073-3>
 Burns, N. Z. *Angew. Chem. Int. Ed.* **2021**, *60*, XX. <https://doi.org/10.1002/anie.202104051>

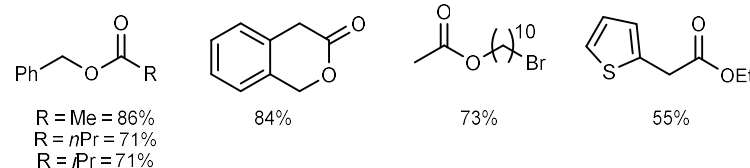
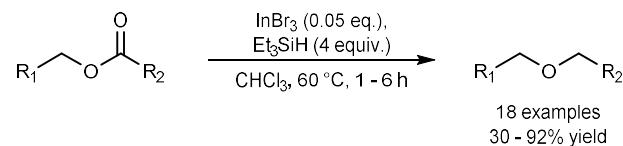
Reduction of Amides:



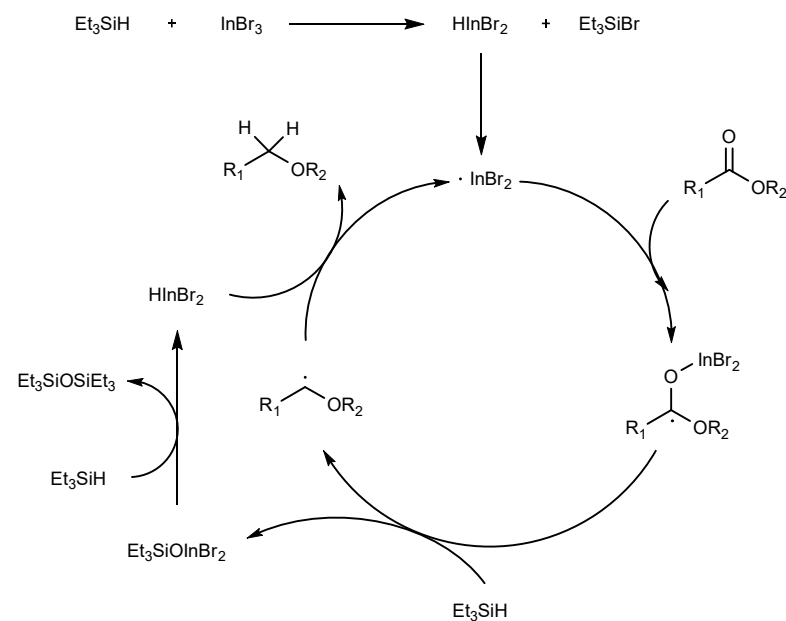
Proposed mechanism:



Reductive Deoxygenation of Esters:



Proposed mechanism:

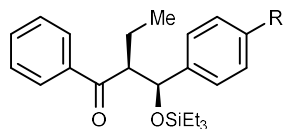
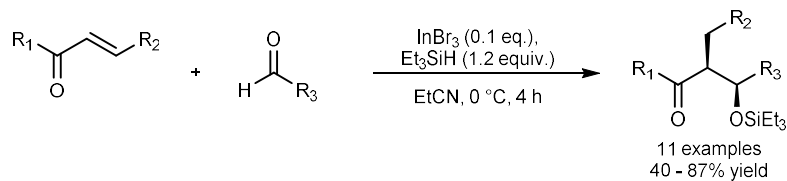


Reasoning: TEMPO shutdown reaction

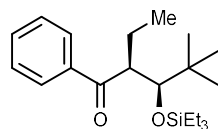
Sakai, N. *J. Org. Chem.* **2007**, *72*, 5920. <https://doi.org/10.1021/jo070814z>. Sakai, N. *Synthesis* **2008**, *21*, 3533. DOI: 10.1055/s-0028-1083191.

Sakai, N. *Tet. Lett.* **2008**, *49*, 6873. <https://doi.org/10.1016/j.tetlet.2008.09.086>

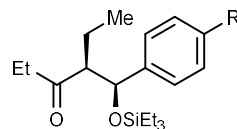
Reductive Aldol:



R = OMe = 75%, 90:10
R = NO₂ = 59%, >99:1
R = H = 59%, 92:8

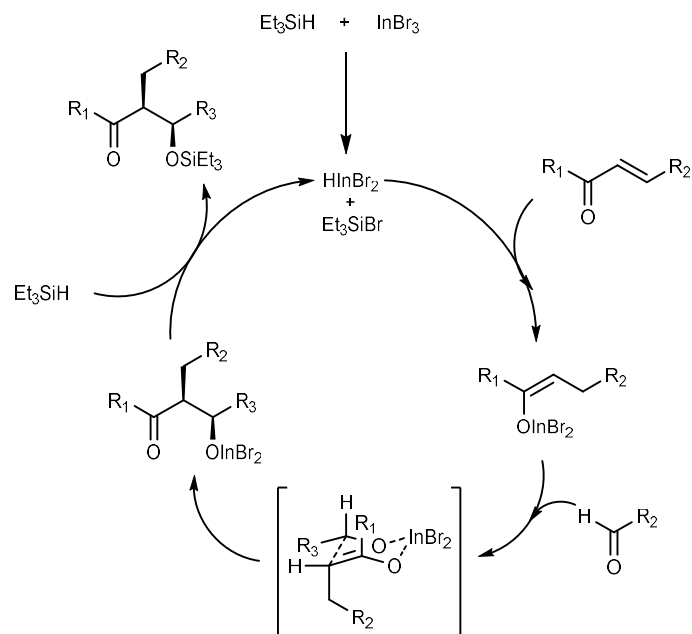


75%
>99:1



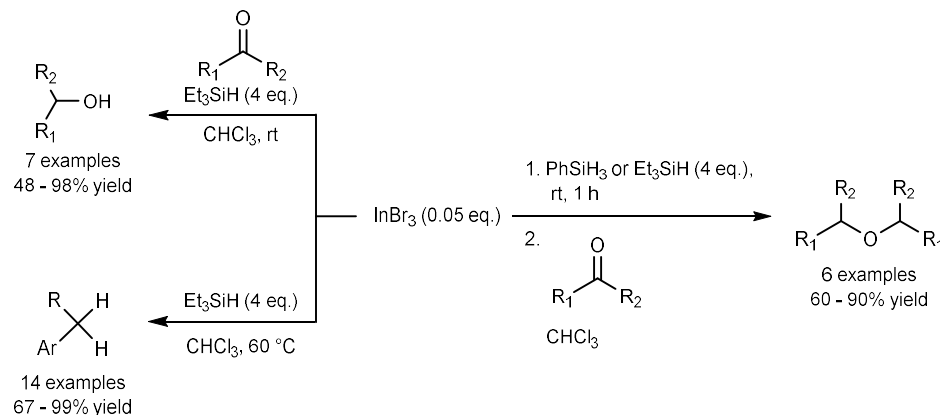
R = OMe = 61%, >99:1
R = H = 40%, >99:1

Proposed mechanism:

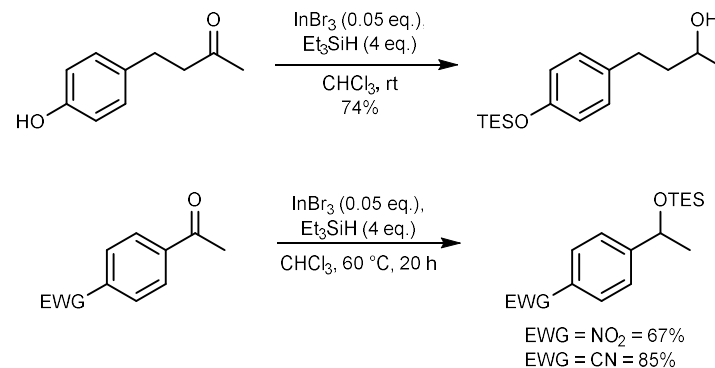


Reasoning: indium aldolate was trapped with Et₃SiBr free conditions

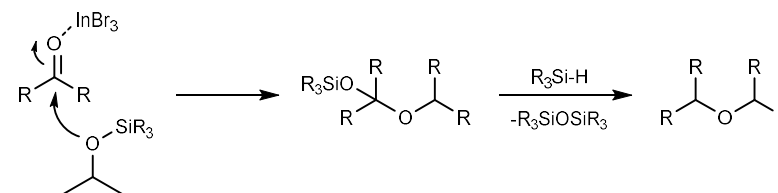
Reduction of Ketones:



Limitations:



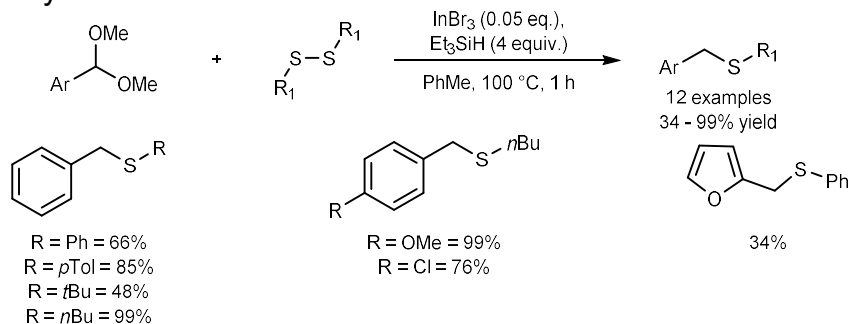
Proposed mechanism:



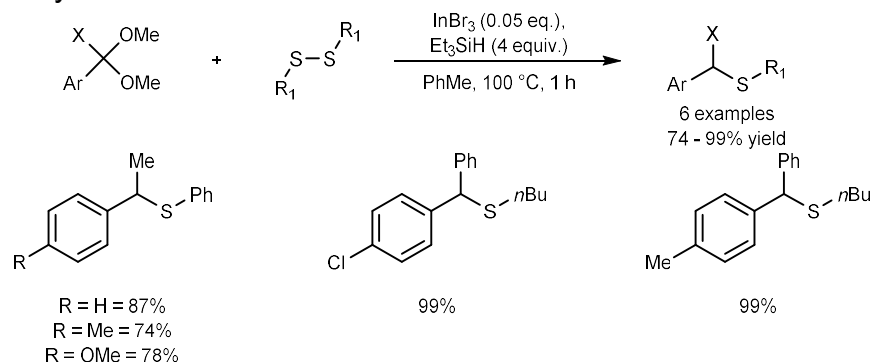
Sakai, N. *Tetrahedron Lett.* **2011**, 52, 3133. <https://doi.org/10.1016/j.tetlet.2011.04.029>

Reductive Sulfidation w/ Disulfides:

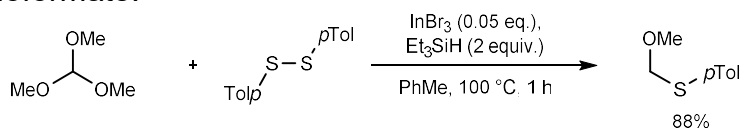
Benzylic acetals:



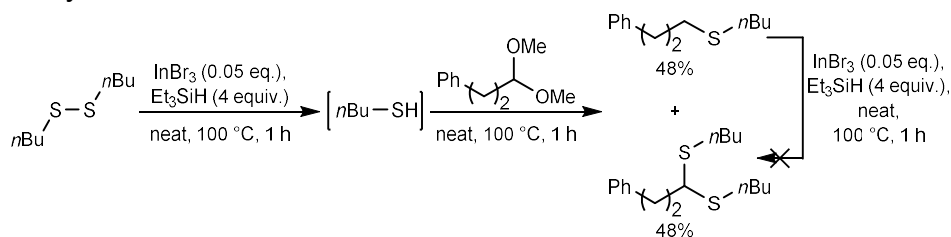
Benzylic ketals:



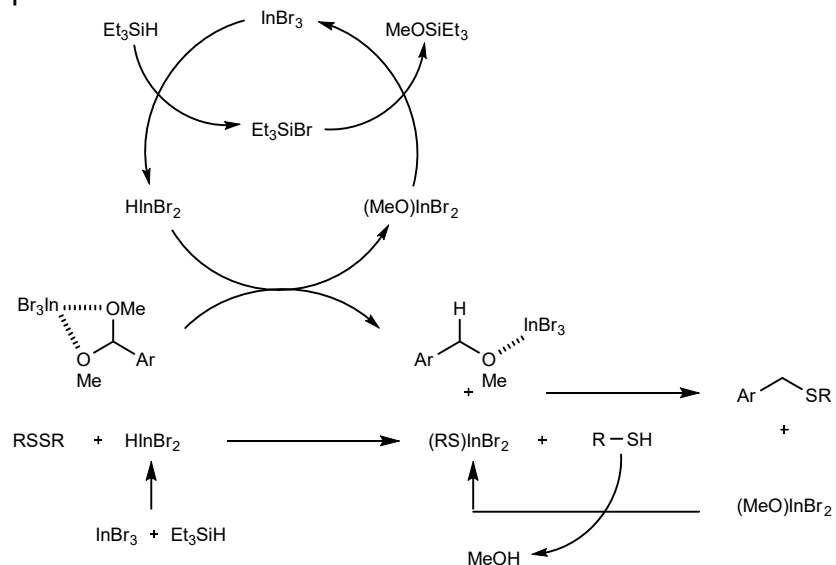
Orthoformate:



Alkyl acetal:

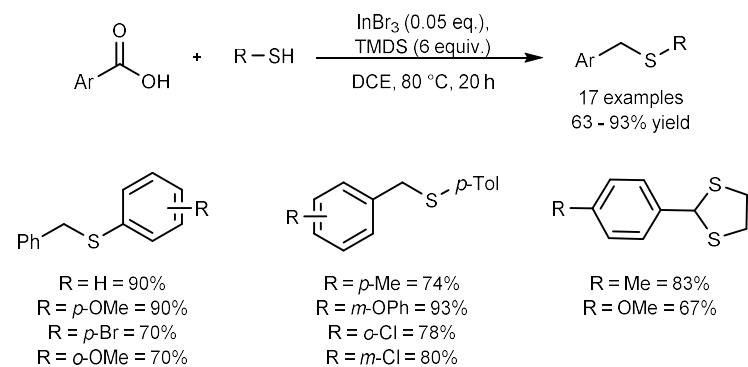


Proposed Mechanism:

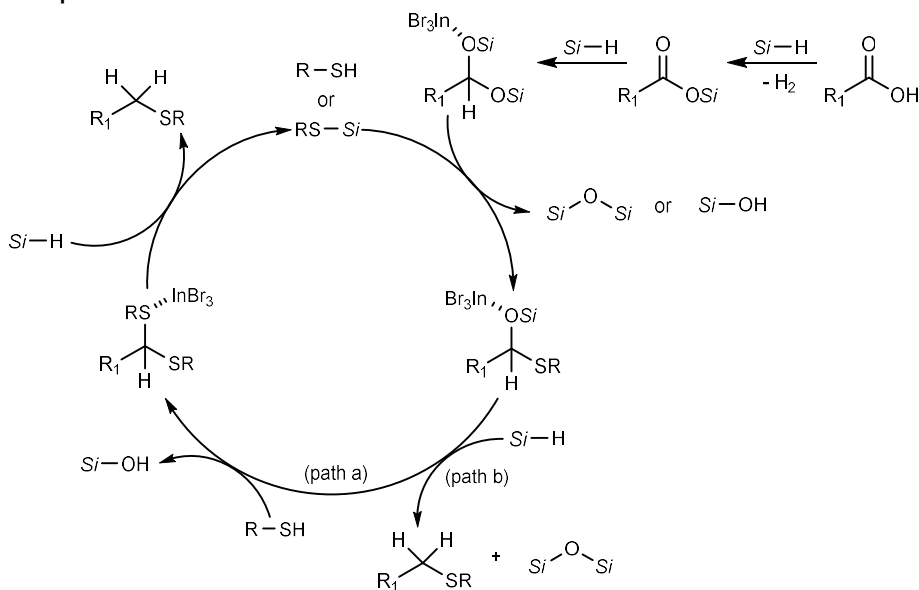


Sakai, N. *Eur. J. Org. Chem.* **2009**, 4123. <https://doi.org/10.1002/ejoc.200900566>

Reductive Coupling of Aromatic Carboxylic Acids w/ Thiols:



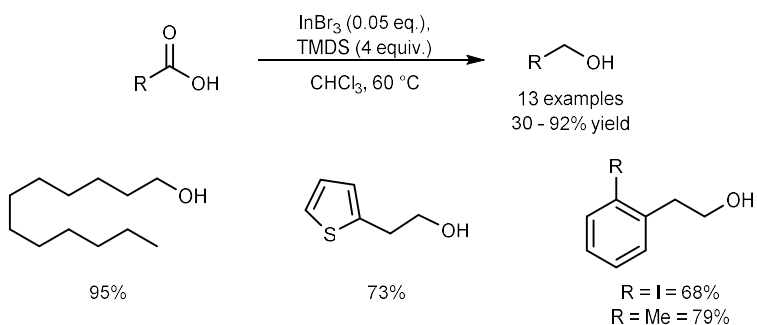
Proposed Mechanism:



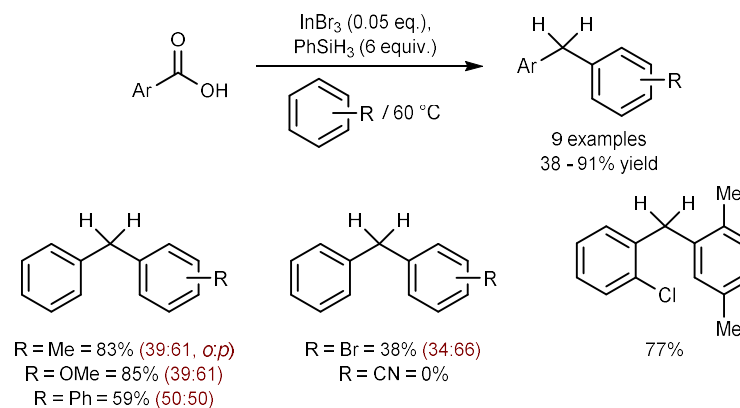
Sakai, N. *Org. Lett.* **2012**, *14*, 4366. <https://doi.org/10.1021/ol302109v>

Deoxygenation of Carboxylic Acids:

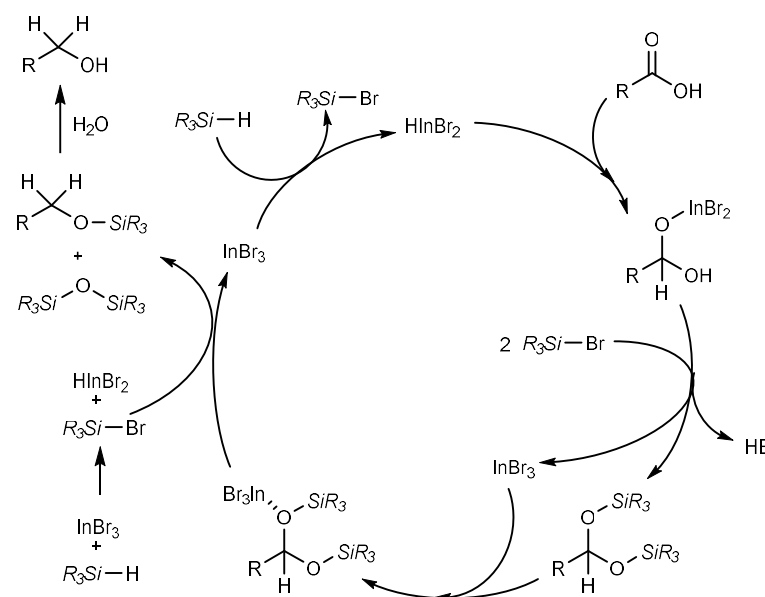
Aliphatic Carboxylic Acids:



Aromatic Carboxylic Acids:



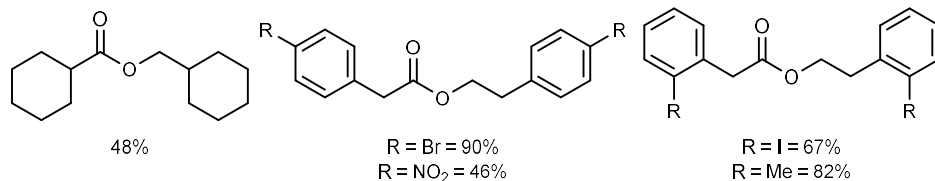
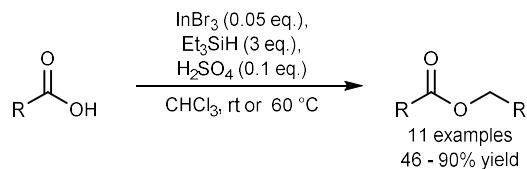
Proposed Mechanism:



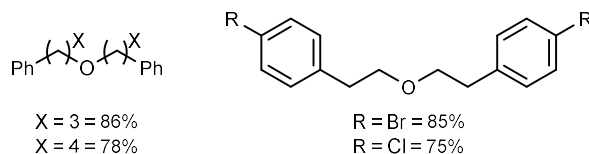
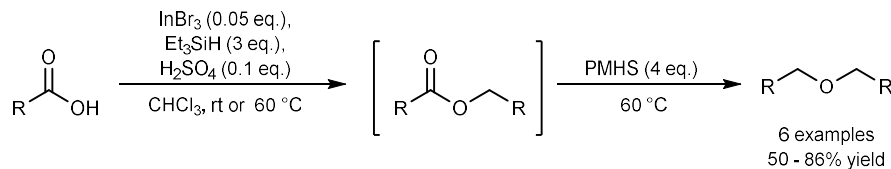
Sakai, N. *Eur. J. Org. Chem.* **2011**, 3178. <https://doi.org/10.1002/ejoc.201100161>

Reductive Esterification of Carboxylic Acids:

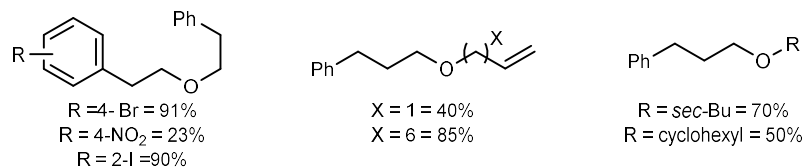
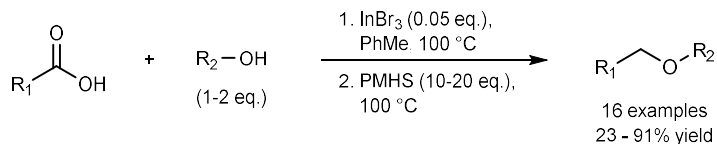
Synthesis of Esters:



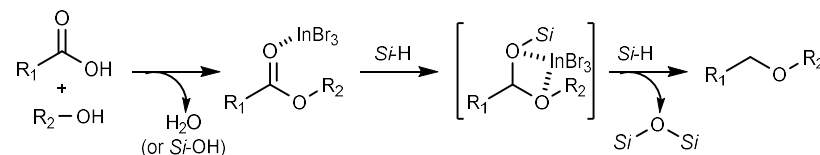
Synthesis of Symmetrical Ethers:



Synthesis of Unsymmetrical Ethers:

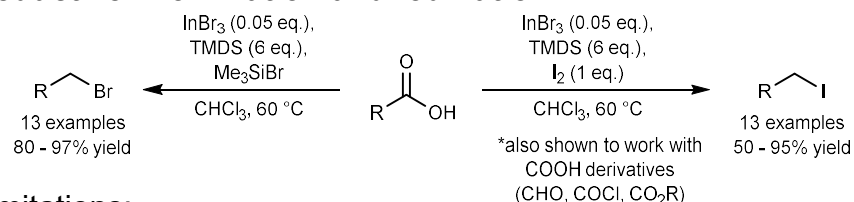


Proposed Mechanism:

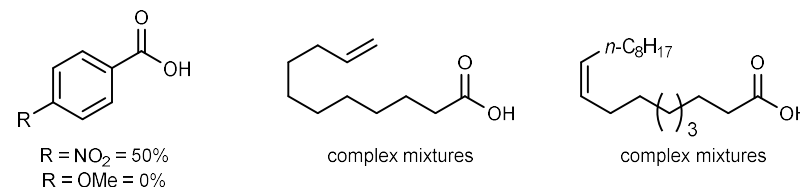


Sakai, N. *Adv. Synth. Catal.* **2011**, 353, 3397. <https://doi.org/10.1002/adsc.201100524>. Sakai, N. *Eur. J. Org. Chem.* **2012**, 4603. <https://doi.org/10.1002/ejoc.201200552>

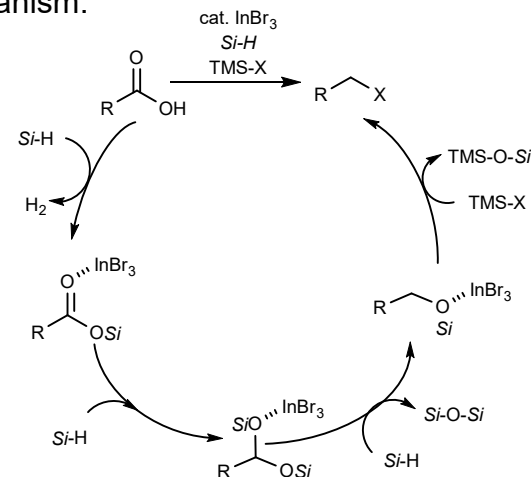
Reductive Bromination and Iodination:



Limitations:



Proposed Mechanism:



Sakai, N. *Org. Lett.* **2012**, 14, 4842. <https://doi.org/10.1021/ol302168g>. Sakai, N. *J. Org. Chem.* **2013**, 10642. <https://doi.org/10.1021/jo401529j>