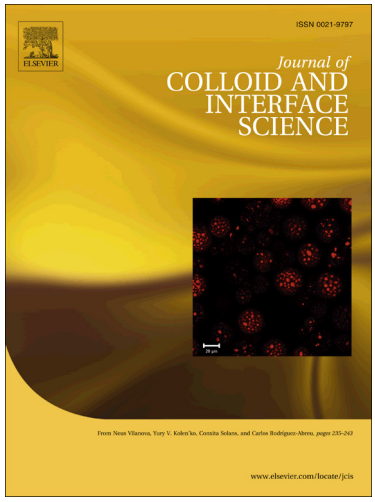
Accepted Manuscript



$Cu_3(BTC)_2$ catalyzed dehydrogenative coupling of dimethylphenylsilane with phenol and homocoupling of dimethylphenylsilane to disiloxane

Nagaraj Anbu, Amarajothi Dhakshinamoorthy

PII: S0021-9797(16)30958-4
DOI: http://dx.doi.org/10.1016/j.jcis.2016.11.081
Reference: YJCIS 21809

To appear in: *Journal of Colloid and Interface Science*

Received Date: 1 November 2016
Accepted Date: 22 November 2016

Please cite this article as: N. Anbu, A. Dhakshinamoorthy, $Cu_3(BTC)_2$ catalyzed dehydrogenative coupling of dimethylphenylsilane with phenol and homocoupling of dimethylphenylsilane to disiloxane, *Journal of Colloid and Interface Science* (2016), doi: http://dx.doi.org/10.1016/j.jcis.2016.11.081

$Cu_3(BTC)_2$ catalyzed dehydrogenative coupling of dimethylphenylsilane with phenol and homocoupling of dimethylphenylsilane to disiloxane

Nagaraj Anbu and Amarajothi Dhakshinamoorthy*

School of Chemistry, Madurai Kamaraj University, Madurai-21.

E-mail:admguru@gmail.com

Abstract

$Cu_3(BTC)_2$ (BTC: 1,3,5-benzenetricarboxylic acid) showed to be an efficient and reusable heterogeneous solid acid catalyst for the formation of Si-O bond through dehydrogenative coupling of dimethylphenylsilane (**1**) with phenol under mild reaction conditions. It is observed that Fe(BTC), MIL-101(Cr) and UiO-66(Zr) are not able to promote this cross coupling between **1** and phenol. $Cu_3(BTC)_2$ exhibits higher stability and activity compared to other MOFs studied here. Furthermore, $Cu_3(BTC)_2$ is reused for three consecutive cycles with a slight decay in its activity. Comparison of the powder XRD patterns of the fresh with three times used $Cu_3(BTC)_2$ showed no significant difference in the crystalline structure thus, indicating the catalyst stability under the optimized reaction conditions. Furthermore, EPR, FT-IR and SEM images of the fresh and reused $Cu_3(BTC)_2$ did not show any change in the oxidation state of copper or structural morphology. Also, no leaching of copper is noticed for this catalytic reaction. In addition, $Cu_3(BTC)_2$ showed higher activity compared to Pt, Pd, Au and Cu supported on active carbon as heterogeneous catalysts in the synthesis of disiloxane from **1** through Si-H activation.

Keywords: $Cu_3(BTC)_2$; Silanes; Heterogeneous Catalysis; Si-O coupling; Green Chemistry