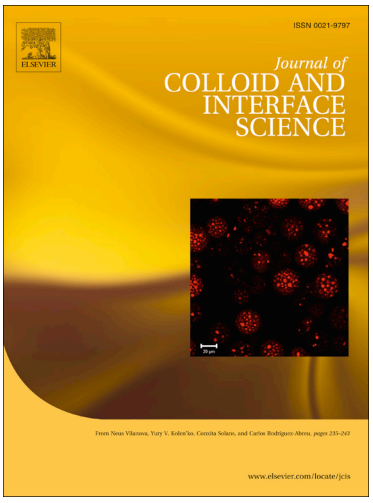

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Silica Nanowires with Tunable Hydrophobicity for Lipase Immobilization and Biocatalytic Membrane Assembly

Qianru Jin,[†] Xianghai Li,[†] Chao Deng,[†] Qian Zhang,[†] Deliang Yi,[†] Xingdong Wang,[‡] Yi Tang[†] and Yajun Wang[†]*

[†]Department of Chemistry and Shanghai Key Laboratory of Molecular Catalysis and Innovative Materials, Fudan University, Shanghai 200433, P. R. China.

[‡]CSIRO Manufacturing, Private Bag 10, Clayton South, Victoria 3169, Australia.

ABSTRACT. Silica nanowires (NWs) with tailored hydrophobicity are synthesized by capping different length of alkyl groups on surface via a one-pot anisotropic sol-gel growth approach. Lipase from *Burkholderia Cepacia* (BCL) is successfully immobilized onto the silica NWs via hydrophobic interaction. The specific activity of the immobilized BCL increases with the increasing length of the capping alkyl groups and surface hydrophobicity of the NWs. BCL immobilized onto the octadecyl groups-capped silica NWs displays the highest specific catalytic activity, which is also notably higher than that of BCL immobilized on octadecyl groups-modified mesoporous silicate. The superior performance can be ascribed to the combination of the interfacial activation of lipases induced by capped-octadecyl groups on the NWs and the improved mass transfer efficiency of reactants around the one-dimensional silica NWs. The