

AARON BANNARD

STUDENT, CHEMISTRY



SYNTHESIS OF ALKENE-TERMINATED SILICON QUANTUM DOTS

Silicon nanocrystals (SiNCs) are non-toxic quantum dots with optical and electronic properties that are both size and ligand-dependent.¹ The preparation of hydride-terminated SiNCs via the thermal reduction of hydrogen silsesquioxane was developed by the Veinot Group at the University of Alberta.¹ Cofunctionalization of SiNCs with dodecene and undecenoic acid, followed by DCC coupling with either 1-undecenol or 1-amino-5-hexene resulted in the formation of alkene terminated particles (Figure 1). Characterization and properties of these species, including Photoluminescence (PL) and Dynamic

Light Scanning (DLS) studies, will be presented. The alkene terminated SiNCs are meant to allow for coupling reactions involving disparately sized SiNCs; results for the coupling reactions will be presented as available.

1. Clark, R.J.; Aghajamali, M.; Gonzalez, C.M.; Hadidi, L.; Islam, A. M.; Javadi, M.; Mobarok, M.H.; Purkait, T.K.; Robidillo, C.J.T.; Sinelnikov, R.; Thiessen, A.N.; Washington, J.; Yu, H.; Veinot, J.G.C. From Hydrogen Silsesquioxane to Functionalized Silicon Nanocrystals. *Chem. Mater.* 2016, 28 (11), 3877-3886.

Research Advisor: Dr. John Washington (CUE) & Dr. Jon Veinot (U of A)

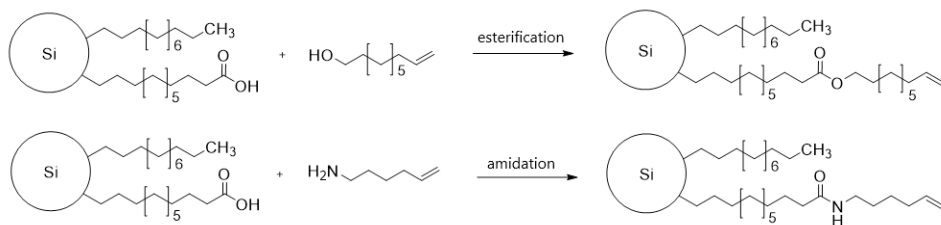


Figure 1. Esterification and Amidation Reactions