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### Tailor made recyclable Pt-nanoparticle catalysts for creation of functionalized vinylsilanes

In recent years, our laboratory has been investigating new and industrially relevant routes to creating heterogeneous platforms of selectively cross-linked polysiloxanes, in which the metal nanoparticles are nucleated in desired concentration and morphology. We have observed that such ensemble of immobilized nanoparticles can act as highly efficient, mild and recyclable catalysts for hydrolytic oxidation of organosilane, hydrosilylation of olefin and polyolefins. In these cases, the air-stable solid catalyst first forms a homogeneous/dispersed phase with the reactant molecules and separates out at the end of reaction. In this presentation, we will present a mild, predictable, facile and widely applicable Pt-based recyclable platinum nanoparticle catalyzed selective hydrosilylation of mono- and di-substituted alkynes is reported. A variety of hydrosilanes were selectively reacted with alkynes containing diverse functionality including -Me, -Ar, -ArMe, -Ar(OMe), -SiMe<sub>3</sub>, (CH<sub>2</sub>)<sub>4</sub>CN, -ArNH<sub>2</sub>, -CH<sub>2</sub>NEt<sub>2</sub> and -COOH to furnish corresponding vinylsilanes in high yields. *In situ* characterization using UV-vis, electron microscopy and controlled poisoning experiments during the reaction has revealed the participation of Pt-nanoparticles as an active catalyst. Whereas, the regio and stereo selectivity of the present nanoparticles catalyst were not very different for the hydrosilylation of certain alkynes reported previously, significant improvement in terms of catalytic efficiency, ease of catalyst recovery and recyclability over other platinum-based catalysts were achieved using polysiloxane stabilized Pt-nanoparticle catalysis. Thus, this catalysis allows one to produce functionalized vinylsilanes in excellent yields with the added advantage of a significant cost improvement over homogeneous platinum complexes.

### Biography

Bhanu P S Chauhan is a Professor and Chairperson of the Chemistry Department at William Paterson University. He rose through the ranks of Assistant and then Associate Professor at City University of New York at the College of Staten Island, (CSI) before moving to his present position. He served at CSI as a Co-director of Center for Engineered Polymeric Materials as well as a Member of CUNY Institute for Macromolecular Assemblies. He has co-authored various world-wide patents and numerous peer reviewed publications and have delivered plenary, invited, and oral presentations at national and international meetings. He has also edited a book titled *Hybrid Nanomaterials*, published by Wiley. Currently, he serves as an Editorial Board and/or Editorial Advisory Board Member of seven peer reviewed journals including *Applied Organometallic Chemistry* and *Silicon*. He has also been an Advisory Board Member of American Chemical Society-New Jersey Polymer Topical Group.

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