

Bagul, R. S.; Jayaraman, N. 2012, "Efficacies of multivalent vs monovalent poly(ether imine) dendritic catalysts within a generation in multiple C-C bond forming reactions", *J. Organomet. Chem.*, 701, 27 – 35.

A challenging issue of organometallic catalysis mediated by dendritic catalysts is to understand how efficient the individual catalytic site mediates a reaction when the sites are clustered at the peripheries of a dendritic molecule. In order to address the query, the substrates that undergo the reaction also need to present multiple reactive centers. An approach to address the so-called multivalent effects in organometallic catalysis is still in infancy, even when there is enormous interest generated in this area in recent years. This manuscript is concerned with establishing the efficacies of individual catalytic sites to mediate reactions on substrates having multiple reactive sites. Synthesis of as many as 14 multivalent catalysts within 0-3 generations of poly(ether imine) dendrimers allowed a gradation in the number of catalytic sites within each generation. Studies involving the C-C bond forming Heck coupling reaction demonstrated that multiple C-C bond forming products form in higher proportions when the number of catalytic moieties increased within the dendritic scaffold. The study thus illustrates, for the first time, the true benefits of multivalent dendritic catalysts to mediate reactions of substrates presenting multiple reactive sites, thereby opening up newer possibilities in organometallic catalysis, especially in multiple C-C bond forming reactions.