



DENDRIMER-BASED CATALYSTS FOR HYDROGENATION OF CONJUGATE DIENES

V.A. Skorkin, A.L. Maximov, E.A. Karakhanov

M.V.Lomonosov Moscow State University, Department of Chemistry, Moscow, Russia

skorkinvitaliy@rambler.ru

Development of novel active and highly selective green catalysts for different applications attracts researchers attention for a long time. Such catalysts allow to conduct reaction repeatedly and could be reused. One of the ways to reach the goal is to design the catalysts, which combine properties of homogeneous and heterogeneous ones. Recently a number of ways to solve this problem has been suggested, such as using of biphasic catalysis, immobilization of metallocomplexes on different supporters etc. Changes in properties of homogeneous metallocomplex as a result of immobilization are mainly defined by the supporting structure. Minimal changes of metal ion microenvironment and mobility are necessary. Catalysts, based on polymers of regular structure, i.e. dendrimers, are to satisfy this requirement.

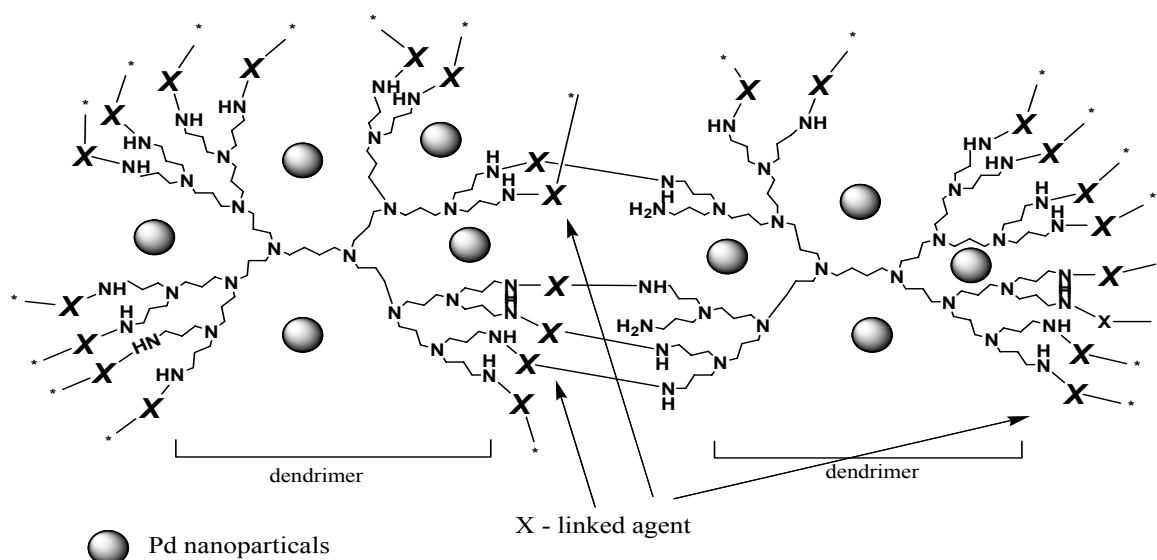
In the present study new methodology was applied to the synthesis of Pd particles immobilized on nanostructured materials that was active in the selective hydrogenation of 1,3-diene and styrenes. Selective hydrogenation of unsaturated compounds is a technologically important process in heterogeneous catalysis. For example dienes are unwanted byproducts of thermal cracking of petroleum cuts. Depending on the target objective, buta-1,3-diene should be converted selectively into but-1-ene in the course of the production of polymers or into but-2-ene for producing petrochemicals (higher olefins, alcohol) or gasoline of high octane number after alkylation. Palladium-based catalysts are frequently used for the selective hydrogenation of buta-1,3-diene.

The cross-linked dendrimers were used as the most convenient supports. The his materials were synthesized based on amine-terminated polypropylene imine dendrimers of different generations and various bifunctional binding agents, like diisocyanates, diepoxides or epichlorohydrin and ets. Anchoring palladium(II) were carry out in MeOH/CHCl₃ solution Pd nanoparticles were synthesysed by reduction of resulting materials.

Obtained materials were investigated by XPS, EPR and TEM.

Nanostructured Pd particle were active and selective catalyst for hydrogenation of conjugate double bounds. So, for hydrogenation of cyclohexadiene output of cyclohexene reached 100% les then 1 h.

It should be noted that there is substrate selectivity for different linked agents. So, for support based on dendrimer and p-methylen diphenildiisocyanate hydrogenation both styrene and stilbene were with the same rate. But for materials based on the same dendrimer and epichlorohydrin – rate of hydrogenation of styrene was in several times higher then for stilbene.



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