

Synthesis of effective hydrosilylation catalysts on the basis of reactions of Rh and Pt complexes with ionic liquids

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Hydrosilylation is a fundamental and elegant method for the laboratory and industrial synthesis of organosilicon compounds.^[1] Hydrosilylation reactions are usually conducted in single-phase homogeneous systems which create the permanent problem of catalyst separation from product after the reaction completion. Therefore efforts have been made at applying heterogeneous catalysts or immobilized metal complexes. One of the methods for producing such catalysts is the employment of ionic liquids as agents for the immobilization of metal complexes. In our research we have obtained a number of catalytic systems of such a type which were based on rhodium and platinum complexes dissolved in phosphonium, imidazolium, pyridinium and ammonium liquids.^[2] Although all the above systems show high catalytic activities, their structure is unknown. This is why we have made attempts to modify selected ionic liquids (corresponding to our most effective systems) and we have applied them as ligands in the synthesis of platinum and rhodium complexes. Another group of catalysts comprises anionic complexes of rhodium and platinum which were obtained by reactions between halide complexes of metals and a respective ionic liquid. Most of the obtained complexes are solids insoluble in hydrosilylation reagents and are characterized by a high catalytic activity. In this communication we will present methods of synthesis of the aforementioned complexes, their characterization and, first and foremost, their catalytic activity for hydrosilylation processes and the possibility of return and multiple use.

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