

Green and sustainable methods in the synthesis of unsaturated organosilicon and related elements compounds

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During the last decades, green and sustainable methods for the synthesis of advanced in structure and function organic and organometallic compounds have been intensively developed. The homogeneous catalysis, which is of prior importance in the formation of stereo-, chemo- and regioselective products, also organosilicon compounds, despite its high utility, suffers from the drawbacks with the catalyst recycling, time-consuming separation methods, as well as large consumption of toxic volatile organic solvents.^[1]

A small number of papers focused on the application of green methods in the synthesis of organosilicon compounds (neoteric solvents, effective catalyst immobilization, repetitive batch and continuous flow catalysis) prompted us to concern about the process sustainability in the synthesis of silyl- and borylsubstituted alkenes.^[2-3] Information about the use of novel solvents in hydrometallation of alkynes has not been yet reported.

Therefore, the new strategies for the synthesis of unsaturated organosilicon and organoboron compounds *via* catalytic hydrosilylation, hydroboration, trans-metallation and alkyne dimerization in green solvents (PEG, IL, scCO₂) and biphasic systems based on PEG/scCO₂ and IL/scCO₂ will be presented. The systems developed by us permitted for effective immobilization of the molecular TM-catalysts, their recycling, and reuse and obtain high TON values. The application of scCO₂ allows simplifying of time- and cost-consuming separation procedures, by the extraction of products in CO₂ stream.^[3]

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