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Адсорбционно-индуцированная сегрегация в биметаллических катализаторах на основе палладия как способ управления каталитическими свойствами

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Полимеры на основе трифениламина: синтез, свойства, применение

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Herz chemistry and its applications in small-molecule functional materials science: achievements, challenges, and prospects RCR5146

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This review discusses the achievements of Herz chemistry over its first century, together with challenges and prospects. The discussion is focused on the synthesis, structure, and reactivity of various closed- and open-shell chalcogen–nitrogen π -heterocyclic species. The latter are derivatives of the (het)areno-fused 1,2,3-dichalcogenazole ring system with S, Se, and less often Te, chalcogens in various spin and charge states encompassing cations, radicals, bipolar ions, and quinoid antiaromatics/diradicaloids. They are important for fundamental chemistry and materials science, specifically for the design and synthesis of metal-free conductive, magnetic, and optoelectronic materials. The potential for further expansion of Herz chemistry within the main group is also considered. A comparative analysis of Herz species and their 1,3,2-isomers (Wolmershäuser species) is provided. Bibliography — 344 references.

Adsorption-induced segregation as a way to control the catalytic performance of palladium-based bimetallic catalysts RCR5148

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The review analyzes recent publications devoted to the experimental and computational studies of adsorption-induced segregation effects in palladium-based bimetallic catalysts. The segregation processes are considered for two types of systems, those based on substitutional solid solutions (alloys) and on intermetallic compounds. The applicability of adsorption-induced segregation effects for fine tuning of active sites on the catalytic surface is discussed. The possibility of controlling catalytic properties in various reactions using these effects is analyzed. The prospects for the development of this research area are given in the conclusion. Bibliography — 138 references.

Polymers based on triphenylamine: synthesis, properties, and applications RCR5152

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Triphenylamine-based conjugated polymers are a class of organic semiconductor compounds that are used in a variety of devices within the field of organic and hybrid optoelectronics, owing to a number of properties inherent in these polymers, including high hole mobility, efficient luminescence, high stability, and the ability to form films from solutions. The modern methods of organic and polymer synthesis allow the implementation of a variety of molecular designs for these polymers, ranging from simple conjugated macromolecules to copolymers with intricate branched and cross-linked structures. This review analyzes the existing modern diversity of triphenylamine-containing polymer structures, proposes their classification for the first time, considers the main approaches to the polymer synthesis, and, using numerous examples, demonstrates how the properties of such materials can be tuned using molecular design. Examples of application of these polymers in various modern devices are given, including perovskite solar cells, metal-ion batteries, electrochromic devices, organic light-emitting diodes, and sensors of various types. Bibliography — 281 references.