
BOOK ABSTRACTS

Kataliz reaktsii organicheskikh soedinenii sery (Catalysis in Reactions of Organosulfur Compounds)

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The monograph systematizes information available on the synthesis and reactions of organosulfur compounds catalyzed by metals and metal oxides, sulfides, and complexes. Much of the material included in the monograph represents studies that have long been carried out at the Boreskov Institute of Catalysis, Siberian Branch, Russian Academy of Sciences.

The consideration of catalytic reactions covers product composition; product formation pathways; reaction kinetics and mechanisms; and the activity, selectivity, stability, and deactivation of various catalysts. The most efficient catalytic systems are discussed, the applicability ranges of catalysts are specified, and optimum conditions are recommended for particular processes.

Reactions between hydrogen sulfide and alcohols with various structures in the presence of acid–base catalysts are considered. These reactions afford alkanethiols, including the commercially important compounds methanethiol and dodecanethiol. Reactions accelerated by proton-donor catalysts are discussed, including the formation of alkanethiols by dialkyl sulfide decomposition and by olefin thiolation and the dealkylation and isomerization of substituted thiophenes. The book summarizes information concerning the reactions catalyzed by surface Lewis acid sites, specifically, dialkyl sulfide synthesis by alcohol thiolation and by alkanethiol condensation, dialkyl disulfide decomposition to alkane-

thiols and dialkyl sulfides, and thiophene synthesis from hydrogen sulfide and furans. The synthesis of thiacycloalkanes by the gas- and liquid-phase hydrogenation of thiophenes in the presence of sulfide catalysts is considered. The book covers thiophene syntheses from aliphatic and cyclic sulfur compounds catalyzed by transition-metal sulfides, thiophene syntheses from hydrogen sulfide and hydrocarbons, and the hydrogenation of disulfides and polysulfides. Careful examination is given to the synthesis of sulfoxides and sulfones by the liquid- and gas-phase oxidation of dialkyl sulfides and thiacycloalkanes with dioxygen on metal oxides and complexes. A detailed analysis is also given to the low-temperature hydrogenation of 2- and 3-thiophene 1,1-dioxides into thiophene 1,1-dioxide in the presence of Group VIII metals or their sulfides or complexes. The metal catalysts are demonstrated to be superior to the other catalytic systems. The sulfur resistance of catalysts is discussed.

The mechanisms reported for the reactions of organosulfur compounds are based on various physicochemical data and on the understanding of the significance of the intermediate chemical interaction between the reactants and the active sites of the catalyst.

The book is designed for specialists in catalysis, fine organic synthesis, petrochemistry, and organosulfur chemistry; engineers; high school teachers; and postgraduates.