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## Contents

**Synthesis and biological properties of amino acids and peptides containing a tetrazolyl moiety** 891

E.A.Popova, R.E.Trifonov

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Literature data mainly published in the last 15 years on the synthesis and biological properties of amino acid analogues and derivatives containing tetrazolyl moieties are analyzed. The tetrazolyl analogues and derivatives of amino acids and peptides are shown to be promising for medicinal chemistry. Being polynitrogen heterocyclic systems comprising four endocyclic nitrogen atoms, tetrazoles can behave as acids and bases and form strong hydrogen bonds with proton donors (more rarely, acceptors). They have high metabolic stability and are able to penetrate through biological membranes. The synthesis and properties of linear and cyclic peptides based on modified amino acids incorporating a tetrazolyl moiety are considered. A special issue is discussion of the biological properties of tetrazole-containing amino acids and peptides, which show high biological activities and can be used to develop new drugs.

Bibliography — 200 references.

**Phosphorylation of aromatic C–H bonds involving metals and metal complexes** 917

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The main achievements and current trends in the development of methods for phosphorylation of aromatic C–H bonds catalyzed by metal salts and complexes are considered. The most important and promising areas of the last five years, including the arylphosphonate synthesis and properties, are distinguished. Methods for the introduction of a phosphonate group into non-activated and functionally substituted aromatic compounds and heteroaromatic molecules and phosphorylation–cyclization reactions involving acetylenes, 2-isocyanobiphenyls and alkynoates are analyzed. The possibilities of ligand-directed phosphorylation of compounds with aromatic C–H bonds and presumed mechanisms and intermediates in the C–P bond formation reactions are considered. The potential of this rapidly developing area of organic and heteroorganic chemistry is noted.

Bibliography — 263 references.

**Molecular imprinting: a tool of modern chemistry for the preparation of highly selective monolithic sorbents** 952

E.G.Vlakh,<sup>a,b</sup> V.A.Korzhirov,<sup>a,b</sup> A.V.Hubina,<sup>b</sup> T.B.Tennikova<sup>a,b</sup>

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Characteristic features of the synthesis of molecularly imprinted polymer systems used as sorbents for separation of complex mixtures into components are discussed. Data about the molecules imprinted in monoliths of various natures and various shapes are integrated. Examples of application of new-generation separating media are discussed. Data on the utilization of the molecular imprinting principle for the fabrication of supermacroporous monolithic cryogels specific to particular molecules, which is important for the design of smart biomaterials, are analyzed.

Bibliography — 293 references.

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A grave problem of modern oil refining industry is related to continuous deterioration of the produced oil quality, on the one hand, and increase in the demand for motor fuel, on the other hand. This necessitates processing of heavy oil stocks with high contents of sulfur, nitrogen and metals and fuel oil residues. These stocks are converted to light oil products *via* hydrogenation processes catalyzed by transition metal compounds, first of all, cobalt- or nickel-promoted molybdenum and tungsten compounds. The processing involves desulfurization, denitrogenation and demetallation reactions as well as reactions converting heavy hydrocarbons to lighter fuel components. The review discusses the mechanisms of reactions involved in the heavy stock hydrotreatment, the presumed structure and state of the catalytically active components and methods for the formation of supports with the desired texture. Practically used and prospective approaches to catalytic treatment of heavy oil as well as examples of industrial processing of asphalt and vacuum residues in the presence of catalysts are briefly presented.

Bibliography — 140 references.