

Muramyl Peptides – Synthesis and Biological Activity

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Muramyl peptides are fragments of peptidoglycan from the cell walls of bacteria. This article concerns muramyl peptides, and new analogues which are considered as prodrugs. Their synthesis and biological activity are also presented.

**Synthesis and Spectroscopic Studies of Cu(II), Co(II),
Ni(II) and Zn(II) Schiff Base Complexes from
1-Amino-5-benzoyl-4-phenyl-1H pyrimidine-2-on
with 2-Hydroxynaphthaldehyde**

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Cu(II), Co(II), Ni(II) and Zn(II) metal complexes of a new heterocyclic Schiff base derived from 1-amino-5-benzoyl-4-phenyl-1H pyrimidine-2-on with 2-hydroxynaphthaldehyde have been synthesized and characterized by elemental analyses, electronic, IR and ¹H NMR spectra, and also by molar conductivity and magnetic moment measurements. It has been found that the Schiff bases behave as a neutral tridentate (ONO) ligand, forming chelates with 1:2 (metal:ligand) stoichiometry. It is suggested that all the complexes have octahedral structure and are non-electrolytes.

A New Substituted Bis(*vic*-dioxime) of Its Mono- and Dinuclear Complexes

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9,10-Bis(hydroxyimino)-4,8,11,15-tetra-aza-1,2,17,18-O-di-iso-propylideneoctadecane (H_2L) was synthesized by the reaction of 1,2-O-iso-propylidene-4-aza-7-aminoheptane and *anti*-dichloroglyoxime in ethanol, containing an excess of $NaHCO_3$ as a buffer to neutralize the HCl formed. The mononuclear metal complexes of this ligand have been synthesized with $Co(II)$, $Ni(II)$, $Cu(II)$, $Zn(II)$ and $Cd(II)$ salts. H_2L forms mononuclear complexes $[(HL)_2M]$ with a metal ligand ratio of 1:2 with $M = Co(II) \cdot 2H_2O$, $Ni(II)$ and $Cu(II)$. $Zn(II)$ and $Cd(II)$ form with H_2L complexes $[(H_2L)(Cl)_2M]$, which have a metal-ligand ratio of 1:1 and a dinuclear complex with $UO_2(VI)$. H_2L forms the dinuclear complex $[(HL)_2(OH)_2M_2]$ with a metal ligand ratio of 1:1 with $M = UO_2(VI)$. Structures of the ligand and its metal complexes were identified by elemental analyses, IR, 1H and ^{13}C NMR spectra and thermogravimetric analyses (TGA).

Synthesis, Spectral Properties and Antitumor Activity of Some Transition Metal Complexes with a Schiff Base Ligand

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Four complexes of transition metals, namely: $[\text{Mn}(\text{L})_2]$ (complex 1), $[\text{Ni}(\text{L})_2 \cdot 0.5\text{H}_2\text{O}]$ (complex 2), $[\text{Cu}(\text{L})_2 \cdot 4\text{H}_2\text{O}]$ (complex 3) and $[\text{Zn}(\text{L})_2 \cdot 0.5\text{H}_2\text{O}]$ (complex 4), (L = Schiff base derived from trimethylol amino methane and salicylic aldehyde), have been synthesized. The complexes were characterized by elemental analysis, IR, ^1H NMR, UV and TG-DTA spectra. Tentative structures for the complexes have been proposed. The antitumor activity against HL-60 human leukemia cells of free ligand and its Mn, Ni, Cu complexes were studied by MTT method.

**Physical Image vs. Structure Relation. 9.
Synthesis and Structural Study of Some
2,5-Bis-alkoxysubstituted 3-Oxolenes and Oxolanes:
An Experimental and Theoretical Approach**

by **R.B. Nazarski and R. Skowroński**

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Two 2,5-bis-substituted 3-oxolenes **2** stable only in anhydrous, acid-free solutions were obtained in the Clauson-Kaas reaction. An immediate catalytic hydrogenation of the *E/Z* isomeric mixture of oxolene **2a**, followed by chromatography, afforded one geometrical form of oxolane diol **4** (isomer **I**), which was subsequently submitted to several attempts of cyclization to an unknown bis-spiroacetal of succinic anhydride (**6**). A rationalization of this process failure and the *Z* geometry of product **I** exhibiting interesting spectroscopic features were inferred from theoretical results (HF/6-31G** calculations) and experimental data for solution (NMR, IR). Some additional *ab initio* GIAO-CPHF NMR computations concerning relevant model bis-acetals **3** and **5** were performed, as well.

Photodehalogenation of 9,10-Dichloroanthracene Induced by Electron Transfer Fluorescence Quenching with Primary and Tertiary Amines in Acetonitrile and *n*-Hexane. Salt Effect on Photodechlorination Process

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Quenching of 9,10-dichloroanthracene (DCA) fluorescence by primary or tertiary amines in acetonitrile solution results in formation of DCA radical anions, amine radical cations and triplet DCA, which were observed by nanosecond flash photolysis. In *n*-hexane, only the triplet-triplet absorption of DCA is observed. Rate constants of back electron transfer from the solvent separated radical ion pair (SSRIP), k_{bet} , were calculated from the quantum yields of charge separation and triplet state formation by assuming a rate of $5 \cdot 10^8 \text{ s}^{-1}$ for ion separation from the SSRIP. The rate constants k_{bet} follow the trends expected from the electron transfer theory (inverted Marcus region). Proton transfer from radical cation of primary amine to the radical anion of DCA, occurring in the contact radical ion pair (CRIP) has been found to be the decisive step for photodehalogenation in *n*-hexane. Importance of the heavy atom effect has been discussed on the basis of photophysical scheme, describing the processes occurring in the CRIP (SSRIP). It has been found, that lithium perchlorate catalyses the photodechlorination of DCA in acetonitrile solution, due to acceleration of the charge separation and retardation of the recombination of formed radical ion pair.

**Effect of Hydrostatic Pressure on the Low Temperature
Phase Transition in Ferroelectrics: $(\text{CH}_3\text{NH}_3)_5\text{Bi}_2\text{Cl}_{11}$
and $(\text{CH}_3\text{NH}_3)_5\text{Bi}_2\text{Br}_{11}$**

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Results of hydrostatic pressure on the low temperature ferroelectric-ferroelectric phase transition in $(\text{CH}_3\text{NH}_3)_5\text{Bi}_2\text{Cl}_{11}$ at about 170 K and $(\text{CH}_3\text{NH}_3)_5\text{Bi}_2\text{Br}_{11}$ at 77 K are presented. The phase transition in both cases revealed a positive pressure coefficient. The pyroelectric coefficients in the vicinity of the low temperature transitions become more and more diffusive as pressure increases. A similar molecular mechanism of phase transitions in both methylammonium salts is postulated.

Glass Transition Temperature of Mixtures of Poly(methyl methacrylate-*co*-ethyl acrylate)

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DSC thermogrammes of mixtures of poly(methyl methacrylate-*co*-ethyl acrylate), PMMA-EA, of different microstructure of macromolecular chains, exhibit two glass transition temperatures, T_g, indicating the presence of two phases. In one phase the copolymer chains are compatible with long blocks of ethyl acrylate and the second phase is very rich in long chains of methyl methacrylate. Based on the ¹³C NMR results for compositional diads distribution and DSC data, a miscibility line can be drawn when the results are presented in a form of a triangular diagram.

Potassium Effects on Kinetics of Propane Oxydehydrogenation on Vanadia-Titania Catalyst

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Oxidative dehydrogenation of propane (ODH) over V_2O_5/TiO_2 and V_2O_5/TiO_2 doped with K was carried out by measuring conversions and selectivities for various feed compositions, contact times and temperatures. The results obtained for both catalysts were interpreted on the basis of the mechanism, in which propene is formed through Eley-Rideal sequence of steps, *i.e.* without participation of the adsorbed propane species. Kinetic constants (activation energies, pre-exponential factors) for the model of ODH reaction of propane on these catalysts, obtained on the basis of steady-state results, are given. Addition of K to vanadia-titania catalysts leads to the decrease of total combustion of propane and consecutive combustion of propene. It has been found that the direct propane total oxidation is 5–9 times lower than that of the consecutive propene oxidation and is almost temperature independent for potassium doped catalyst, whereas it quickly decreases with temperature for a non-doped catalyst. Secondly, the addition of K to a vanadia-titania catalyst decreases the activation energies for propene formation (k_1), parallel formation of CO_x (k_3) and reoxidation of the catalyst (k_{OS}). Potassium exhibits a stronger inhibitory effect on the secondary propene combustion, what reflects the lower acidity of V^{+5} cations modified by the strongly basic alkali oxide species.

**Synthesis of Eu(III) and Tb(III) Complexes with
Two New Aryl Amide Type Tetrapodal Ligands and
Their Luminescence Properties**

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**Reactivity of Two Protolytic Forms of Methylene Blue
in Reaction with Ascorbic Acid**

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**Accelerated Formation Kinetics
of Nickel Hydride in a Planar Ni Foil**

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**Microwave Irradiation Accelerated Detosylations
of Poly(*p*-tosyl) Macrocyclic Polyamines**

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