Synthesis and Characterization of Iron(III), Cobalt(II), Nickel(II) and Copper(II) Complexes of 4-Formylazohydrazoaniline Antipyrine

by F.A. El-Saied¹, M.I. Ayad¹, R.M. Issa² and S.A. Aly³

¹Department of Chemistry, Faculty of Science, El-Menoufia University, Shebin El-Kom, Egypt
²Department of Chemistry, Faculty of Science, Tanta University, Tanta, Egypt
³Department of Chemistry, Genetic Engineering and Biotechnology Research Institute, El-Menoufia University, Sadat City

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4-Formylazohydrazoaniline antipyrine and its iron(III), cobalt(II), nickel(II) and copper(II) complexes have been synthesized and characterized by IR, electronic spectra, molar conductivities, magnetic susceptibilities and ESR. The ligand behaves as a neutral bidentate and tridentate ligand in the hydrazo form or monobasic tridentate ligand in the enol-azo form. Coordination takes place via the carbonyl oxygen of the side chain, azomethine nitrogen atom for bidentate coordination. The carbonyl oxygen of the pyrazolone ring is added for tridentate coordination and enolic oxygen appears in monobasic tridentate coordination.
A novel tetranuclear iron complex has been synthesized and characterized by X-ray single crystal structural analysis: [Fe₄O₂(O₂CC₂H₅)₇(bipy)₂]PF₆·2H₂O (bipy = 2,2′-bipyridine). The title complex crystallizes in the monoclinic system, space group C2/c, with lattice parameters \( a = 27.859(2) \) Å, \( b = 13.0629(10) \) Å, \( c = 17.2698(14) \) Å, \( \beta = 123.6080(10) \) °. The molecular structure shows that there are two types of coordination environment for Fe(III) atoms. One is formed by two N atoms and four O atoms, another by six O atoms, all in distorted octahedron, which forms a “butterfly” core structure. The corresponding variable temperature susceptibility measurement shows the antiferromagnetic interactions in the complex.
The Titanium(IV), Iron(III) and Manganese(II) Complexes of Chrysin-4′-sulfonate

by J. Pusz, B. Nitka and S. Wołowiec

Faculty of Chemistry, Rzeszów University of Technology,
6 Powstańców Warszawy Ave., P.O.Box 85, 35959 Rzeszów, Poland;
E-mail: jpusz@prz.rzeszow.pl

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The chrysin-4′-sulfonic acid and its sodium salt (Nachsa-4′) have been synthesized and characterized by $^1$H and $^{13}$C NMR spectroscopy. New complexes of Ti(IV), Mn(II) and Fe(III) ions with chs4′ anion in solid state were obtained. Their composition and some physicochemical properties were studied by thermogravimetric analysis, UV/Vis, infrared spectroscopy and magnetic measurements. The structure of the compounds was elucidated on the basis of the results obtained.
Replacement of an Anomeric Hydroxyl Group by a Halogen Atom Using PdCl₂/Et₃SiH/Halogen Source System

by H.H.A.M. Hassan and A.H.F. El-Husseiny

Chemistry Department, Faculty of Science, Alexandria University, P.O 426 Ibrahimia, 21321-Alexandria, Egypt, E-mail:hassan@safwa.com.eg.

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The anomeric hydroxyl group of perbenzylated and peracetylated carbohydrates can be stereoselectively replaced by a bromine or iodine atom using palladium dichloride, triethylsilane and carbon tetrabromide and/or iodine at room temperature. To illustrate the synthetic potential of this novel method, some models of O- and C-glycosides are reported. Reduction of sugar halide using excess of triethylsilane was not successful.
Specific Interactions of Cu\(^{2+}\) Ions with Enantiomers of Hepatitis B Virus Surface Antigen 140–146 Region

by J. Świętek-Kozłowska\(^1\), J. Brasuń\(^{1,2}\), Z. Maćkiewicz\(^3\) and G. Kupryszewski\(^3\)

\(^1\)Department of Basic Medical Sciences, Wrocław Medical University, 51-603 Wrocław, Kochanowskiego 14, Poland; Email: JSK@basmed.am.wroc.pl
\(^2\)Faculty of Chemistry, University of Wrocław, F. Joliot-Curie 14, 50-383 Wrocław, Poland
\(^3\)Faculty of Chemistry, University of Gdańsk, 80-952 Gdańsk, Poland

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Potentiometric and spectroscopic studies on Cu(II) interactions with 140–146 fragment of the hepatitis B virus antigen have shown that the basic binding sites of metal ion are centered at a peptide N-terminal donor system and the side chain donor atoms are not competing in the metal ion coordination.
Bisbenzisoselenazol-3(2H)-ones, a New Group of Ebselen Analogues

by M. Osajda¹, K. Kloc¹, J. Młochowski¹, E. Piasecki² and K. Rybka²

¹Institute of Organic Chemistry, Biochemistry and Biotechnology, Wroclaw University of Technology, Wyb. Wyspianskiego 27, 50-375 Wroclaw, Poland
²Laboratory of Virology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, R. Weigla 12, 53-114 Wroclaw, Poland

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The title compounds with benzisoselenazolone moieties connected by spacers such as phenylene, bisphenylene, alkylene, oxaalkylene, azaalkylene and dithiaalkylene groups have been obtained in the reaction of 2-(chloroseleno)benzoyl chloride with compounds having two primary amine groups, while the secondary amines gave products of their selenenylation and/or acylation. Bisbenzisoselenazol-3(2H)-ones were found, in the antiviral assay in vitro, to be inhibitors of cytopathic activity of RNA and DNA viruses: EMCV, HSV-1 and VSV.

Peptidyl Diazomethylketones as Cysteine Protease Inhibitors Structurally Based Upon the Inhibitory Centers of Cystatins

by F. Kasprzykowski¹, R. Kasprzykowska¹, P. Kania¹, K. Plucińska¹, A. Grubb², M. Abrahamson² and C. Schalén³

¹Faculty of Chemistry, University of Gdańsk, 80-952 Gdańsk, Poland
²Department of Clinical Chemistry, University Hospital, S-22185 Lund, Sweden
³Department of Infectious Diseases and Medical Microbiology, University Hospital, S-22185 Lund, Sweden

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Six new putative cysteine protease inhibitors based upon sequences of the N-terminal binding fragments of rat cystatin A, bovine cystatin C and human cystatins D and S were synthesized. Inhibitory activities of these compounds against papain and bovine cathepsin B were tested. Additionally, agar well diffusion test of their antibacterial activity against Streptococcus pyogenes was performed.
C₆-Alkane Reactions over γ-Alumina Supported Palladium Catalysts

by M. Skotak and Z. Karpiński

Department of Catalysis on Metals, Institute of Physical Chemistry, Polish Academy of Sciences,
ul. Kasprzaka 44/52, 01-224 Warszawa, Poland

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A series of Pd/Al₂O₃ catalysts of different Pd loading were tested in C₆-alkane reactions. Different catalyst pretreatment was used to change both the acidity of alumina and the state of palladium. A parallel study with the use of n-hexane and 2,2-dimethylbutane showed several similarities in the catalytic behaviour of the Pd/Al₂O₃ catalysts. Highly reduced catalysts showed completely different performance than samples reduced at lower temperatures. High temperature reduction leads to a big enhancement of catalytic activity and also vastly increases the isomerization selectivity. Considerable changes were also noticed in the activation energy. Oxidation and subsequent mild reduction of highly reduced samples brings about, however, different results for isomerization selectivity: a partial recovery in the case of n-hexane and only a very small change for the 2,2-dimethylbutane reaction. The results confirm the major contribution of acidic sites present in activated alumina to the overall catalytic behaviour of Pd/Al₂O₃ samples.
Aromatic Solvent Effect on Polarity and Proton-Transfer Equilibrium in Phenol–Triethylamine Systems

by Z. Pawelka and T. Kuc

Department of Physical Chemistry, University of Wroclaw, F. Joliot-Curie 14, 50-383 Wroclaw, Poland

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Dipole moments of hydrogen-bonded complexes of 4-nitrophenol–triethylamine and 2,4,6-trichlorophenol–triethylamine have been determined in various aromatic solvents. On this basis, the Gibbs energy $\Delta G_{PT}$ of the proton-transfer equilibrium has been estimated. The aromatic solvent effect on the proton transfer has been discussed in terms of two solvation contributions, arising from a local complex-aromatic molecules interaction and a long-range dielectric effect. The microstructure of the solvent near a complex has been taken into account, utilizing a dielectric model of two spherical solvent layers. The crucial effect of the size of the aromatic solvent molecules on $\Delta G_{PT}$ has been simulated by variation of the thickness of the first solvation layer.
The Influence of Montmorillonite Treatment on Structure, Sorption Properties and Catalytic Behaviour: Part I. Zirconia Pillared Clays Modified with Manganese as Denox Catalysts

by T. Grzybek\textsuperscript{1}, J. Klinik\textsuperscript{1}, D. Olszewska\textsuperscript{1}, H. Papp\textsuperscript{2} and J. Smarzowski\textsuperscript{1}

\textsuperscript{1}Faculty of Fuels and Energy, University of Mining and Metallurgy, Al. Mickiewicza 30, 30-059 Krakow, Poland
\textsuperscript{2}Lehrstuhl für Technische Chemie, Faculty of Chemistry and Mineralogy, University of Leipzig, Linnestr 3, 04103 Leipzig, Germany

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Clays were pillared with zirconium aquahydroxycations starting from untreated or HCl-pretreated montmorillonite. The supports were promoted with manganese by adsorption method. Structure and texture was studied by XRD and low temperature argon sorption. The information on distribution of manganese was obtained from XPS and textural studies. Catalytic activity in SCR reaction was shown to depend on the initial pretreatment of montmorillonite. Selectivity to nitrogen was connected with the distribution of active material.
Unexpected Catalytic Activity of N-Hydroxyphthalimide Combined with Some Co-catalyst in Oxidation of Organic Substrates by Dioxygen

by P.J. Figiel and J.M. Sobczak

Faculty of Chemistry, University of Wroclaw, F. Joliot-Curie 14, 50-383 Wroclaw, Poland
Tel. +048 (71) 3204-386, fax +048 (71) 3282-348, e-mail: js@wchuwr.chem.uni.wroc.pl

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The combination of N-hydroxyphthalimide and various co-catalyst affords an efficient catalytic system for the aerobic oxidation of organic substrates. Thus, acids, tertiary and quaternary ammonium salts and typical Lewis acids (e.g. BF₃) are effective co-catalysts. Their role is concerned to weakness the O–H bond in NHPI via hydrogen bond formation or as the result of the donor-acceptor interaction.
Tetrahydrofuran Ring Opening Initiated by a Catalytic Action of a Diazooalkanes/Boron Trifluoride Etherate Combination

by W.Z. Antkowiak

Faculty of Chemistry, Adam Mickiewicz University,
Grunwaldzka 6, 60-780 Poznań, Poland. E-mail: wzantk@amu.edu.pl

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Synthesis and Structure of Tris(N-methyl-1-benzimidazol-2-yl) Amine Copper(II) Nitrate with Two-Dimethylsulfoxide Solvate

by J.-L. Wang¹, H.-Sh. Guo² and F.-M. Miao¹

¹Institute of Chemical Crystallography, Tianjin Normal University, Tianjin 300074, P.R. China
²Chemical Teaching and Research Group, The Medical College of Chinese Peoples Armed Police Forces, Tianjin 300162, P.R. China

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Water Molecules as a Gluing Factor in Organic Crystals. 
Part 2. The Crystal and Molecular Structure of 
6-Acetoxy-2,5,7,8-tetramethylchroman-2-carboxylic 
Acid Monohydrate

by S. Witkowski¹, R. Anulewicz-Ostrowska² and T.M. Krygowski²

¹Institute of Chemistry, University in Białystok, Piłsudskiego 11/4, 15-443 Białystok, Poland
²Department of Chemistry, University of Warsaw, Pasteura 1, 02-093 Warsaw, Poland

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Carbon-13 Isotope Effect for Carbon Dioxide Formation in the Reaction of Liquid Formic Acid with Uranium Trioxide

by M. Zieliński¹, A. Zielińska¹, N. Ogrinc², H. Papiernik-Zielińska¹ and I. Kobal²

¹Faculty of Chemistry, Jagiellonian University, Ingardena Str. 3, 30-060 Cracow, Poland, Fax: (48-12) 634-05-15
²J. Stefan Institute, SI-1000 Ljubljana, Jamova Str. 39, Slovenia
Tel: + 386 61 177 300 Fax No.: +386 61 177 38 11, 219

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Synthesis of New Sulfenic Acid Anilides from Aromatic Disulphides in the Presence of Silver Nitrate

by B. Doczekalska, M. Wejchan-Judek and I. Polus

Institute of Chemical Technology and Engineering, Poznan University of Technology,
Pl. M. Skłodowskiej-Curie 2, 60-965 Poznań, Poland

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Synthesis and Properties of Zinc Aluminate Catalyst

by J. Wrzyszcz¹, M. Zawadzki¹, H. Grabowska¹, W. Miśta¹ and J. Trawczyński²

¹Institute of Low Temperature and Structure Research, Polish Academy of Sciences, 50-950 Wrocław-2, P.O. Box 1410, Poland
²Institute of Chemistry and Technology of Petroleum and Coal, Wrocław University of Technology, 50-344 Wrocław, Gdańska 7/9, Poland

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Mixed and Concentration Equilibrium Constants of Protonation and Complexation Reactions at Low and High Ionic Strength. System: Carboxylic Acid – Co(II), Ni(II) and Cu(II) Ion

by E. John and K. Kania

Institute of Chemistry, University of Silesia, Szkolna 9, 40-006 Katowice, Poland

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Synthesis and Properties of New Bimetallic Complexes of General Formula: 
\[\text{[Ni(diamine)}_2\text{]}_3\text{[Cr(NCS)}_6\text{]}_2\cdot\text{nH}_2\text{O}\]

by L. Dobrzańska¹, G. Wrzeszcz¹, A. Grodzicki¹ and F. Rozpłoch²

¹Faculty of Chemistry, Gagarina 7
²Institute of Physics, Grudziądzka 5/7, Nicholas Copernicus University, 87-100 Toruń, Poland

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The Stereochemical Character of $s^2$ Lone Pair in Bi$^{3+}$ Aqua Cation

by B. Włodzimirska and A. Bilewicz

Department of Radiochemistry, Institute of Nuclear Chemistry and Technology, Dorodna 16, 03-195 Warsaw, Poland
e-mail: abilewic@orange.ichtj.waw.pl

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