MS20 P01

Solid state complexes of calix[4]arene diphosphate with chlorhexidine and pilocarpine. Oksana Danylyuk[a], Kinga Suwinska[a], Adina Lazar[b], Anthony W. Coleman[b],[a]*Institute of Physical Chemistry PAS, Warsaw, Poland.* [b]*IBCP, Lyon, France.*
E-mail: danylyuk@ichf.edu.pl

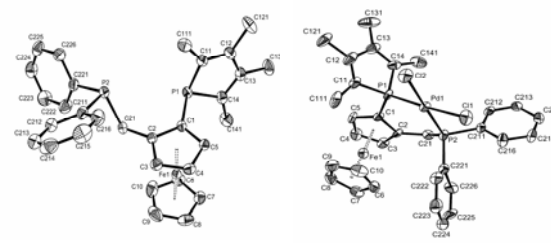
Keywords: calix[4]arene, water-soluble, co-crystal

Pharmaceutical co-crystals, formed between an active pharmaceutical ingredients (API) and a co-crystal former, have been the subject of growing interest in the last decade. The co-crystallization of drug with co-crystal former offers the opportunity to modify chemical and physical properties of API and control drug conformation. The calix[*n*]arenes are a class of macrocyclic organic host molecules widely studied due to theit ability to include a wide range of neutral and charged guests. The capacity of the calixarenes to complex various molecules in aqueous phase is interesting for biopharmaceutical application. The solid state structure of the molecular complexes of water-soluble calix[4]arene diphosphate with antiseptic chlorhexidine and dopamine agonist pilocarpine will be presented. In both cases, the drug molecules are complexed outside the macrocyclic cavity of the host due to the interdigitation of two calixarenes forming a dimeric unit. The role of hydrogen bonds and aromatic-aromatic interactions will be discussed.

MS20 P02

Design of New Chiral Ferrocene-Bridged Phosphole ligands. Sandrine Vincendeau, Eric Manoury, Maryse Gouygou, Jean-Claude Daran. *Laboratoire de Chimie de Coordination, 205 route de Narbonne, 31077 Toulouse Cedex, France.* E-mail : daran@lcc-toulouse.fr

Development of asymmetric metal-catalyzed reactions has played a significant role in allowing synthetic access to biologically important molecule. Enantiopure 1,2-disubstituted ferrocene derivatives, especially ferrocenyl-phosphine ligands, have been widely and successfuly used as ligands in homogeneous transition metal catalysis.[1] Most of these chiral ferrocene based ligands possess classical tertiary phosphine group and no attention has been paid to ferrocenyl ligands with non-classical phosphine such as phosphole.
As part of our continuing interest in the ferrocene chemistry[2] and in the design of new chiral phosphole based ligands[3], we have investigated the synthesis and X-ray structural characterization of a series of mixed phosphole-ferrocene ligands and investigated their coordination chemistry.



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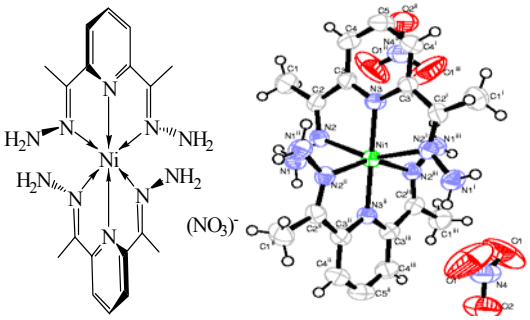
MS20 P03

Synthesis, crystal structure and biological activity of the nickel(II) complex of 2,6-diacetylpyridinedihydrazone
N.Burcu Arslan[a], Canan Kazak[a], A. Dilek Azaz[b], Selma Celen[b], Hilmi Namli[b], Onur Turhan[b] and Raif Kurtaran[b]
[a]*Ondokuz Mayıs Univ., Department of Physics, Samsun-Turkey.* [b]*Balikesir Univ., Department of Biology and Chemistry, Balıkesir-Turkey.*
E-mail: barslan@omu.edu.tr

Keywords: Diffraction structure analysis, nickel(II) complex, antibacterial and antifungal activity

A complex of Ni (II) with 2,6-diacetylpyridinedihydrazone (L) towards nickel(II) has been prepared and characterized by means of elemental analyses, IR, electronic spectra and single crystal X-ray analyses. $[NiL_2](NO_3)$, was crystallized in the tetragonal space group P-4 21 c. The complex exhibits the expected coordination sphere with six nitrogen atoms coordinated to the central Ni^{II} with a deformation from pseudo-octahedral geometry. The Antimicrobial activities of the ligand and its complex were investigated.



MS20 P04

Theme and variations: the conformational polymorphs of chlorpropamide Tatiana N. Drebushchak[a,b], Nikita V. Chukanov[ac], Elena V. Boldyreva[ab], [a]REC-008 Novosibirsk State University, Russia, [b]Institute of Solid State Chemistry and Mechanochemistry SB RAS, [c]Novosibirsk Institute of Organic Chemistry SB RAS, E-mail: boldyrev@nsu.ru

Keywords: polymorphism, pharmaceuticals, crystal engineering

The problem of polymorphism of drug substances is important for several reasons. If a polymorphic transition occurs during manufacturing process, the un-controlled formation of another polymorph as compared to the starting material can result in the deterioration of the quality of a dosage form in terms of its bioavailability, or shelf-life. It can also have consequences if a patent specifies the manufacture and sale of a particular polymorph. On the other hand, an ability to control the polymorphism of a drug opens new routes to improving the quality of an already known product and to launching new products into the market.

Chlorpropamide, 4-chloro-N-((propylaminocarbonyl)-benzenesulfonamide, is an antidiabetic drug. Although the existence of several polymorphs of this compound was reported, by 2006, the crystal structure was solved only for one of them [1]. In 2006, we have initiated a systematic study of the crystallization of chlorpropamide from different solvents and from the same solvent under different conditions. Up to now, five polymorphs were obtained as single crystals, and for three of them crystal structures were solved [2-4]. The structures can serve as a very beautiful example of the polymorphism in a system with similar intermolecular hydrogen-bonds pattern, but different packing of molecules in different conformations. Different structures result in the pronounced differences in density (up to 5 %), IR-spectra, melting temperatures (several °C) and melting enthalpy (up to 15 %).

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MS20 P05

2-Nitro-3,4,4-trichloro-1-mono(ethylthio)-1-mono[1-(diphenylmethyl)-piperazine]-1,3-butadiene Compound

N.Gulsah Deniz[a], Cemil Ibis,[a] [a]*Department of Chemistry, Istanbul University.Istanbul,Turkey*
E-mail: yurdakul@istanbul.edu.tr

Keywords: crystal structure of organic compounds, organic sulfur compounds, chemical crystallography

It is known that monoaryl- and diarylpiperazines are important for clinical chemistry [1]. Some piperazine compounds were used in gen transfer reactions[2]. The piperidinyl derivatives show an excellent biological activity and chemical effects and according to the an US-patent, some thiosubstituted dienes exhibit high biological activity also [3].
2-Nitro-3,4,4-trichloro-1-mono(ethylthio)-1-mono[1-(diphenylmethyl)-piperazine]-1,3-butadiene was synthesized and crystal structure was determined. The compound crystallizes in the Orthorhombic crystal system (space group $P2_12_12_1$) with the unit cell parameters a=9.4240(2) Å, b=14.4007(2) Å, c=18.1891(2) Å, $\alpha\beta$, $\gamma=90^o$, V=2468.48(7) $Å^3$, Z=4. The structure has been solved by direct methods (SIR92) [4] and refined to the residul index R_1= 0.078.

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MS20 P06

Structural proof for synergetic behaviour in organogels: Stearicacid/Octadecanol

Daniel Kalnin[a], Kees van Malssen[b], Henny Schaink[a], Erik van der Linden[a], Food Physics Laboratory, Wageningen University, P.O. Box 8129, 6700 EV Wageningen, The Netherlands. [b]Foods Structural Design, UFHRI, Unilever R&D, Vlaardingen, The Netherlands;
E-mail: daniel.kalnin@web.de

Keywords: lipid polymorphism, lipid crystallization, polymorphic structures

The structural properties of oils and fats are of interest for different sectors of the technological and scientific community. The mineral oil industry is interested in methods preventing gelation of (crude) oil in pipe lines [1, 2]. On the other hand novel materials based on structured oil matrices are desired as well in food technology [3-5] for structured products as in pharmaceutical technology for controlled release properties [6] or in material science for tuning hardness of materials.
Here we present the structural properties of organogels made from mixtures of stearic acid (Ac) and 1-octadecanol (Ol) in vegetable oil and a rheological evaluation of the resulting texture. Oscillating strain measurements are performed as a function of the temperature on the ternary system Ac/Ol/liquid vegetable oil. The total mass concentration of Ac/Ol was kept constant at 5 wt% in the ternary systems. Rheology experiments reveal a strong increase of the elastic modulus at temperatures under 30^oC. It is shown that the 1 to 2 mixture of Ac/Ol has an elastic modulus that is significantly larger than that of the other ternary samples. Using microscopy it is found that the shape of the crystals in the samples depends strongly on the composition of the mixture. The cause of the observed behavior of the elastic modulus lies in the crystal morphology due to the molecular structure of the self assembled lipid crystals. X-ray diffraction at small and wide angles revealed that at a 2/1 ratio a compound crystal is formed. The resulting crystal form is vey likely to the β modification of the StStSt. However no esterification could be noticed. The understanding of this synergetic effect in a very narrow concentration range of 1-octadecanol, and stearic acid in the organogels provides the possibility to tune the hardness of the lipid matrix.

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