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Review

Photodynamic Therapy: Porphyrins and Phthalocyanines as Photosensitizers

Leonardo Marmo Moreira, Fábio Vieira dos Santos, Juliana Pereira Lyon, Maira Maftoum-Costa, Cristina Pacheco-Soares, Newton Soares da Silva

Aust. J. Chem. **2008**, *61*, 741–754.

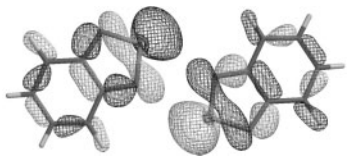
Photodynamic therapy consists of a treatment for malignant and non-malignant diseases that uses light and a dye to produce cellular death through the activity of reactive oxygen species. The study and development of dyes, called photosensitizers, such as porphyrins and phthalocyanines, is an important issue for the improvement of photodynamic therapy. The physicochemical properties of these compounds and the mechanism of formation of oxygen reactive species, including the ability to generate cell death, constitute fundamental prerequisites to understanding the photodynamic action and its potential application in several diseases.

Rapid Communications

The Structure of 4,7-Bis((trimethylsilyl)ethynyl) benzo[*c*][1,2,5]thiadiazole and Identification of a Widespread S···N Structural Motif

Amar Boudebous, Edwin C. Constable, Catherine E. Housecroft, Markus Neuburger, Silvia Schaffner

Aust. J. Chem. **2008**, *61*, 755–757.

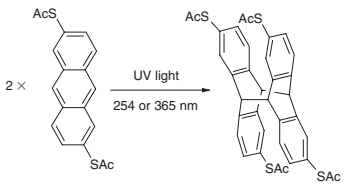


A widespread weak interaction has been identified in solid-state SN heterocycles. The solid-state structure of 4,7-bis((trimethylsilyl)ethynyl) benzo[*c*][1,2,5]thiadiazole exhibits intermolecular S···N contacts significantly shorter than the sum of the covalent radii. Computational studies have established the nature of this interaction, which is shown to be widespread in heterocycles of this type.

Synthesis and Characterization of Anthracene-2,6-dithioacetate: a Rigid, Conjugated Molecule for the Formation of Monolayers on Gold

Patrick J. West, Hadi M. Zareie, Andrew M. McDonagh

Aust. J. Chem. **2008**, *61*, 758–761.



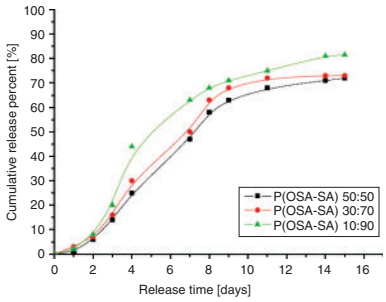
The synthesis and characterization of a new photoswitchable anthracene compound, anthracene-2,6-dithioacetate, is presented. The compound dimerises in solution upon irradiation with UV light and thin films can be formed on gold surfaces from both the monomer and photodimer.

 0004-9425/08/100xxx

Synthesis, Characterization, and Properties of Copolyanhydrides Based on 2-Octylsuccinic Acid and Sebacic Acid

Yousef M. Hamdan, Shitao Fu, Xiangmei Jiang, Yinhua Cheng, Kaixun Huang, Kaichao Yu

Aust. J. Chem. **2008**, *61*, 762–767.



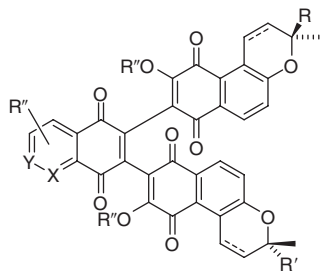
2-Octylsuccinic acid and its copolyanhydrides with sebacic acid have been synthesized by melt polycondensation. In vitro studies showed that all copolymers are degradable in phosphate buffer at 37°C. The release profiles of ciprofloxacin hydrochloride followed first-order kinetics, and the drug release rate increased moderately with the content of sebacic acid.

Full Papers

Antiviral Agents. I. Synthesis and Antiviral Evaluation of Trimeric Naphthoquinone Analogues of Conocurvone

Ian T. Crosby, Mark L. Rose, Maree P. Collis, Paula J. de Bruyn, Philip L. C. Keep, Alan D. Robertson

Aust. J. Chem. **2008**, *61*, 768–784.



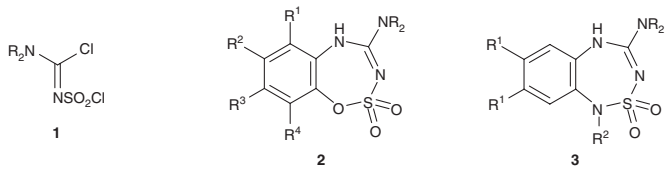
A general and convenient synthesis of trimeric naphthoquinones using the condensation of 2-hydroxy-naphthoquinones and 2,3-dihaloquinones is described. The application of this method to the synthesis of a series of trimeric naphthoquinone simple analogues of conocurvone (see figure) is also reported together with their anti-HIV activity.

***N*,*N*-Dialkyl-*N*′-Chlorosulfonyl Chloroformamidines in Heterocyclic Synthesis. Part VII 4-Dialkylamino [1,2,3,5]Benzoxathiadiazepine Dioxides and 4-Dialkylamino [2,1,3,5]Benzothiatriazepine Dioxides**

Teresa Cablewski, Craig M. Forsyth, Craig L. Francis, Andris J. Liepa, Victor Tran

Aust. J. Chem. **2008**, *61*, 785–796.

The applicability of *N*,*N*-dialkyl-*N*′-chlorosulfonyl chloroformamidines **1** to the synthesis of novel heterocyclic ring systems has been extended to seven-membered rings. The preparation and characterization of some new [1,2,3,5]benzoxathiadiazepines **2** and [2,1,3,5]benzothiatriazepines **3** by the reaction of **1** with 2-aminophenols and 1,2-diaminobenzenes are reported. Some regioselective alkylation and acylation reactions of representative examples of **2** and **3** demonstrate the potential of these compounds as scaffolds for synthetic and medicinal chemistry.

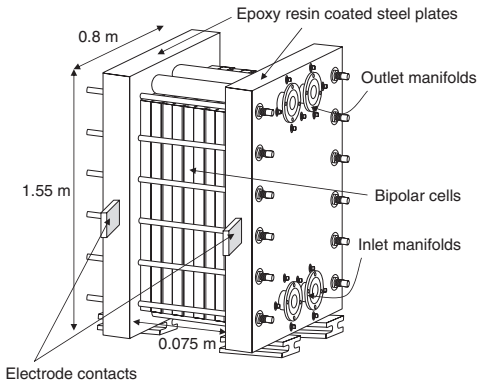


Mass Transport and Flow Dispersion in the Compartments of a Modular 10 Cell Filter-Press Stack

Carlos Ponce-de-León, Ian Whyte, Gavin W. Reade, Stewart E. Male, Frank C. Walsh

Aust. J. Chem. **2008**, *61*, 797–804.

A 10 bipolar cell filter-press stack has been used to determine flow dispersion, pressure drop, and averaged mass transport measurements to characterize the reaction environment in an industrial electrochemical reactor. The technology used the polysulfide/sulfide and Br_3^-/Br^- systems. Comparison is made with a similar system that contains five bipolar cells.

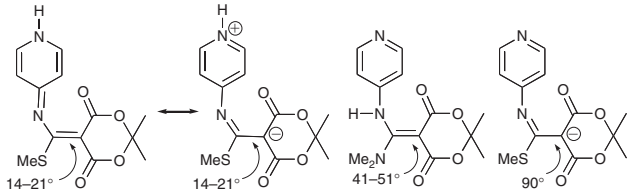


Twisted Push–Pull Ethylenes

Rakesh Naduvile Veedu, Paul V. Bernhardt, Rainer Koch, Curt Wentrup

Aust. J. Chem. **2008**, *61*, 805–812.

Push–pull substituted ethylenes with highly twisted formal C=C double bonds have been synthesized. The twisted structures are stabilized by a pronounced zwitterionic character. Twisting angles between 14 and 90° were determined by X-ray crystallography and are mostly well reproduced by theoretical calculations, except for the case of the 90° twist, which is partially attributed to crystal packing forces.

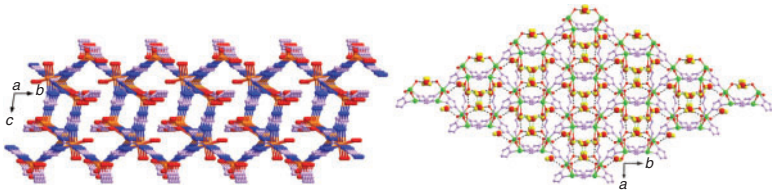


Two Novel Triazole-Based Metal–Organic Frameworks Consolidated by a Flexible Dicarboxylate Co-ligand: Hydrothermal Synthesis, Crystal Structure, and Luminescence Properties

En-Cui Yang, Qing-Qing Liang, Xiu-Guang Wang, Xiao-Jun Zhao

Aust. J. Chem. **2008**, *61*, 813–820.

Two triazole-based complexes **1** and **2** with a flexible dicarboxylate co-ligand gt, were synthesized and characterized to reveal a 2D pillared-bilayer and a 3D framework with tetranuclear $[Cd_4(trz)_4]^{4+}$ subunits, respectively. The gt co-ligand consolidated the overall structure formed by the Zn^{II}/Cd^{II} and trz anions, and served as a weak hydrogen bond acceptor to capture guest water molecules.



1 **2**

Halophenol Rearrangement in Lewis Acid-Catalyzed Friedel–Crafts Conditions: Evidence of Competitive Initial Protonation and Acylation

Koushik Saha, Nordin H. Lajis, Faridah Abas, Nabil Ali Naji, A. Sazali Hamzah, Khozirah Shaari

Aust. J. Chem. **2008**, *61*, 821–825.

Halogen rearrangement occurs during the Lewis acid-catalyzed Friedel–Crafts reaction of phthalic anhydride and bromophenols or bromoanisole. Further investigation revealed that 2-, 3-, and 4-bromophenols undergo rearrangement into other isomers under this reaction condition. Products distribution from these reactions suggested that halogen rearrangement takes place during the s-complex intermediate of the condensation step. Iodophenol undergoes hydrodeiodination rapidly, while chlorophenol does not undergo rearrangement at all.

Administering Pesticide Assays in In Vivo-Implanted Biosensors

Suw Young Ly, Young Sam Jung, Chang Hyun Lee, Bang Won Lee

Aust. J. Chem. **2008**, *61*, 826–832.

An analytical pesticide assay of *O*-ethyl-*O*-4-(nitrophenyl) phenyl phosphonothioate (EPN) was carried out using a DNA-immobilized carbon nanotube paste electrode (DPE). This method was shown to be more sensitive than other voltammetric or common analytical methods. In contaminated conditions, a handmade, needle-type electrode can be implanted into live fish tissue (a) and orange tissue (c) under non-destructive conditions that can qualify for EPN assay. A patch-type electrode attached to the non-treated apple's skin surface (b) was detected for the EPN peak potential. The methods presented herein may be used in pesticide assays or environmental analyses.