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RESEARCH FRONT: Porphyrazine Chemistry

Review

Porphyrazines: Designer Macrocycles by Peripheral Substituent Change

Matthew J. Fuchter, Chang Zhong,
Hong Zong, Brian M. Hoffman,
Anthony G. M. Barrett

Aust. J. Chem. **2008**, *61*, 235–255.



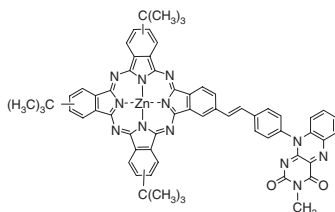
A review of the synthetic strategies towards functionalized porphyrazines is given and new methods towards the preparation of heteroatom-appended porphyrazines are discussed. In addition, the diverse array of applications to which the porphyrazine macrocycles can be applied are highlighted, which include their use as molecular scaffolds, catalysts, and for biomedical purposes as imaging and therapeutic agents.

Full Papers

Flavin Core as Electron Acceptor Component in a Zinc(II)- Phthalocyanine-Based Dyad

Andreas Gouloumis,
G. M. Aminur Rahman, Julia Abel,
Gema de la Torre, Purificación Vázquez,
Luis Echegoyen, Dirk M. Guldi,
Tomas Torres

Aust. J. Chem. **2008**, *61*, 256–261.

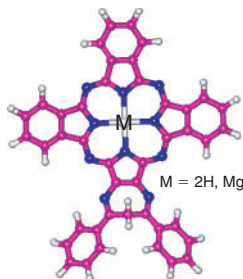


The flavin core as electron acceptor component in a zinc(II)-phthalocyanine-based dyad is described for the first time. The system has been electrochemically and photophysically characterized. The occurrence of photoinduced electron transfer in this donor–acceptor conjugate is observed.

Synthesis and Spectroscopic Properties of Low-Symmetry Tribenzoporphyrazines with Annulated 6*H*-1,4-Diazepine Ring

Maria Pia Donzello, Claudio Ercolani,
Luisa Mannina, Elisa Viola,
Alëna Bubnova, Ol'ga G. Khelevina,
Pavel A. Stuzhin

Aust. J. Chem. **2008**, *61*, 262–272.



Novel low-symmetry ‘push–pull’ porphyrazine macrocycles that carry one 1,4-diazepine ring and three benzene rings have been prepared. Spectroscopic analysis reveals that the diazepine ring is preponderantly present as the 6*H* tautomer and not as the alternative 1*H* form. Factors that determine the appearance of the 6*H* and 1*H* forms and their specific influence on the physicochemical properties of the porphyrazine macrocycle need further investigation.

Synthesis of Covalently-Linked Phthalocyanine–Phthalocyanine and Porphyrin–Phthalocyanine Dimers

Alexey Lyubimtsev, Zafar Iqbal,
Michael Hanack

Aust. J. Chem. **2008**, *61*, 273–278.

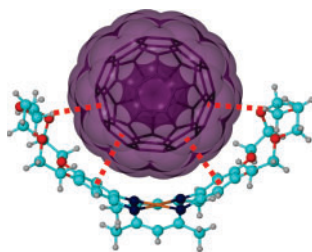
Dimeric phthalocyanines and phthalocyanine–porphyrins linked by an alkyl-aryl chain are important for many applications. The paper describes an easy route for the synthesis of such compounds. Our method represents a convenient pathway to homonuclear and heteronuclear dimeric phthalocyanines and phthalocyanine–porphyrin compounds.

Full Papers

Templating Linear Alignment of Fullerene C₆₀ Molecules Involving a Curved Macrocycle

Marck Norret, Mohamed Makha,
Alexandre N. Sobolev, Colin L. Raston

Aust. J. Chem. **2008**, *61*, 279–282.



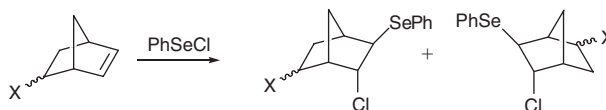
The extended-saddle-shape of a nickel-containing macrocycle that bears two 15-crown-5 ether pendant moieties promotes the formation of a 1:1 complex with fullerene, by covering more of the surface of the carbon structure. X-Ray analysis reveals that complexation organises the fullerenes into 1D arrays with the crown moieties may enhance water solubility.

The Reaction of 5-Substituted-2-Norbornenes with Phenylselenenyl Chloride

D. Alan R. Happer, Thomas Francis,
Jonathan M. White

Aust. J. Chem. **2008**, *61*, 283–287.

Phenylselenenyl chloride adds to the double bond of 5-X-substituted-2-norbornenes to give adducts in which the phenylselenenyl group adds *exo* and the chloro *endo*. Adduct ratios have been determined for a range of X, and the results interpreted in terms of the electronic effect of X and whether it is *exo* or *endo*. Electronic effects control the regiochemistry in the *exo* series, whereas in the *endo*, proximity effects are dominant.

**Synthesis, Characterization, and Antibacterial and Cytotoxic Study of Metal Complexes with Schiff Base Ligands**

Lei Shi, Rui-Qin Fang, Jia-Yu Xue,
Zhu-Ping Xiao, Shu-Hua Tan,
Hai-Liang Zhu

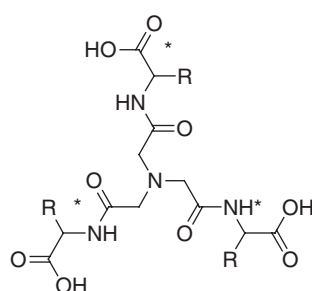
Aust. J. Chem. **2008**, *61*, 288–296.

A series of metal complexes with Schiff base ligands were prepared and evaluated for their antibacterial and cytotoxic activities. Among the compounds tested, cobalt complexes **1a**, **2a**, **3a**, and **4a** showed the most favourable antibacterial and cytotoxic activities.

Synthesis of Dianionic and Trianionic Chiral, Chelating Ligands Based on Amino Acids

Madeleine Schultz, Jakov Kulis,
Julie Murison, Genevieve W. Andrews

Aust. J. Chem. **2008**, *61*, 297–302.

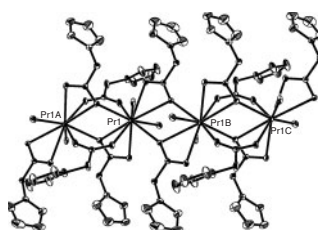


The use of amino acids as the source of chirality in polyacid ligands allows easy access to a family of chiral ligands. This paper presents the synthesis of two such ligand families, based on nitrilotriacetic acid and methyliminodiacetic acid cores, giving rise to C₃ symmetry triacid and C₁ symmetry diacid ligands, respectively. These ligands are expected to be biologically compatible and to promote asymmetric catalysis.

New Coordination Polymers of Lanthanide(III) with Tetrazole-1-acetic Acid: Synthesis, Crystal Structures, and Magnetic Properties

Xiu-Qing Zhang, Qing Yu,
He-Dong Bian, Shi-Ping Yan, Dai-Zheng Liao, Wen Gu, Hong Liang

Aust. J. Chem. **2008**, *61*, 303–309.

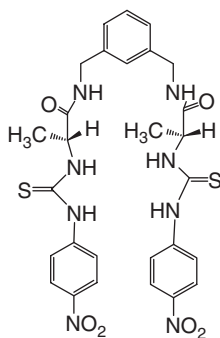


Four new lanthanide coordination polymers (Ln = La **1**, Pr **2**, Nd **3**, and Sm **4**) with tetrazole-1-acetic acid are reported. **1** and **2** are isostructural. While structurally similar to **1**, the ligands arrangement in **3** has changed. **4** consists of two types of metallic molecules. Weak antiferromagnetic coupling is observed between metal centres in **2** and **3**.

Synthesis and Chiral Recognition Properties of a Novel Colorimetric Chiral Sensor for Carboxylic Anions

Zhi-Hong Chen, Yong-Bing He,
Chen-Guang Hu, Xiao-Huan Huang,
Ling Hu

Aust. J. Chem. **2008**, *61*, 310–315.



The chiral receptor as shown has a recognition ability to D-mandelate than L-mandelate anion. The different colour change occurred when the chiral anions were added to the host. The binding study was examined by ^1H NMR and UV-vis spectra.

Focus

Intramolecular Oxidative Heck Cyclization: a Novel Pathway to Cyclopentenones

Thanh V. Nguyen

Aust. J. Chem. **2008**, *61*, 316.

This focus article gives a brief review of the recently developed method to prepare polycyclic systems containing cyclopentenones, important structural components for numerous natural products. Cyclopentenones can be produced from an efficient new sequence involving a palladium-catalyzed intramolecular Heck cyclization. This synthetic route has great potential in the total syntheses of natural and bioactive compounds.