About the Cover

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The cover illustrates the synthesis and anticancer process of a multifunctional system, which combines photodynamic therapy and chemical therapy with folic acid cancer targeting by using an Eu-based metal-organic framework (EuBTC). The well-arranged nanospheres exhibit as promising drug delivery systems for enhanced targeted anticancer therapy.

Articles

pp. 619–627

Functionalized Eu(III)-based nanoscale metal-organic framework for enhanced targeted anticancer therapy
Pan Chen, Ya-Fan Huang, Guang-Yu Xu, Jin-Ping Xue and Juan-Juan Chen*

The complex occurrence and development of cancer inspired us to combine photodynamic therapy and chemical therapy to achieve enhanced anticancer activities and utilize cancer-targeting ligands to improve cancer targeting. We have used a Eu(III)-based metal-organic framework to conjugate with zinc(II) phthalocyanines and folic acid, then load the chemical drug doxorubicin. This nanosystem has high singlet oxygen generation and doxorubicin release. In vitro experiments demonstrated that this nanosystem has high cancer targeting and enhanced anticancer effects.

pp. 628–638

Intramolecular electron transfer in porphyrin-anthraquinone donor–acceptor systems with varying molecular bridges
Naresh Duvva, A. R. Ramya, Govind Reddy and L. Giribabu*

Porphyrin anthraquinone donor–acceptor dyads having either ester (ZnTTP-AQ1) or ether (ZnTTP-AQ2) linkages have been designed, synthesized and characterized by various spectroscopic techniques. Quenched fluorescence and lifetime indicates the electron transfer from singlet excited state of porphyrin to the anthraquinone moiety and electron transfer rates are found in the range of $0.43 \times 10^4$ to $10.52 \times 10^6$ s$^{-1}$.
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Investigation of solvation and solvent coordination effects in iron porphyrin nitrosyls by infrared spectro-electrochemistry and DFT calculations
Md. Hafizur Rahman and Michael D. Ryan*

Spectroelectrochemical and DFT evidence was obtained for the solvation and coordination of iron porphinone nitrosyls in THF and dichloromethane. In THF, the solvent was the sixth ligand. The carbonyl group showed a solvation effect in both solvents. DFT results confirmed the experimental results.

**pp. 645–654**

Synthesis, structure, photophysical, electrochemical properties and antibacterial activity of brominated BODIPYs as an inhibitor of DNA gyrase B of *S. aureus*
Dijo Prasannan, Chennakkandathil Sareena, Chellaiah Arunkumar and Suchithra Tharamel Vasu*

An enzyme-targeted mechanism of action of 2,6-dibromo-1,3,5,7-tetramethyl-8-(4-acetamido)-4-bora-3a,4a-diaza-s-indacene against DNA gyrase B in *Staphylococcus aureus* has been validated. The present study suggests a new therapeutic strategy against this potential pathogen.

**pp. 655–663**

Synthesis, singlet oxygen generation and DNA photocleavage of β,β′-conjugated polycationic porphyrins
Li Chen, Yimei Zhao, Xinyu Sun, Jun Jiang, Fengshou Wu* and Kai Wang*

Three β,β′-conjugated cationic porphyrin compounds (PCP1, PCP2, and PCP3) were designed and synthesized. The interaction modes between these porphyrins and ct-DNA were studied by UV-vis spectroscopy and fluorescence emission spectroscopy. The $^1\text{O}_2$ generation rate of PCP1~PCP3 followed the order of PCP2 > PCP1 > H$_2$TMPyP > PCP3. Finally, the photocleavage effect of porphyrins on pBR322 plasmid DNA was studied by gel electrophoresis.

**pp. 664–670**

Dithienosilole extended BODIPYs: Synthesis and spectroscopic properties
Yijuan Sun, Lizhi Gai*, Yitong Wang, Zhirong Qu* and Hua Lu*

The synthesis, characterization, and theoretical analysis of dithienosilole-vinyl-BODIPY dyes are described in this study. The absorption and emission maxima are dramatically bathochromically shifted compared with the parent BODIPY, originating from the greater extension of the π conjugation by incorporation of dithienosilole (DTS) moieties.
pp. 671–678
Synthesis of dipyroromethanes in water and investigation of electronic and steric effects in efficiency of olefin epoxidation by sodium periodate catalyzed by manganese tetraaryl and trans disubstituted porphyrin complexes
Mojtaba Bagherzadeh*, Mohammad Adineh Jonaghani, Mojtaba Amini and Anahita Mortazavi-Manesh

Condensation of pyrrole with various aldehydes in the presence of BF₃ etherate as a acid catalyst in water provides good yield of some dipyromethanes. Prolongation of the reaction time with aldehydes substituted by electron-donating (mesityl) or electron-withdrawing (2,6-dichlorophenyl) groups on the ortho positions of the phenyl did not lead to decomposition or scrambling. Manganese trans disubstituted porphyrin complexes derived from various dipyromethanes and manganese tetraaryl porphyrin complexes including various substituents with different steric and electronic properties show good catalytic activity in epoxidation of alkenes by NaIO₄ in the presence of imidazole (ImH). The study of steric and electronic effects of the catalysts on the epoxidation of olefins shows that Mn-porphyrin complexes with more bulky and electron-releasing groups on meso-phenyls could increase the epoxidation yield of most alkenes.

pp. 679–684
N-Methylpyridylporphyrin tailed with folate conjugate as a potential lysosomal-targeted photosensitizer: Synthesis, DNA interaction, singlet oxygen and subcellular localization
Yi-Mei Zhao, Qian-Qian Lu, Si Yao, Hui-Fang Su, Hong-Jian Liu, Ze-Jiang Wang, Feng-Shou Wu and Kai Wang*

In recent years, great interest has been focused on safe and effective antitumor treatments based on photosensitizers (PS) for use in photodynamic therapy (PDT). As a good lysosomal-targeted drug, folic acid (FA) is highly concerned as well. A new N-methylpyridylporphyrin tailed with folate conjugate (Me-Por-FA) was prepared. Results suggest that Me-Por-FA could be developed to be a lysosomal-targeted photosensitizer for precise photodynamic therapy.

pp. 685–689
Novel oxidation state — zinc(III) in chelate with 3,7,11,15-tetraazaporphine and one fluorine ligand: Quantum-chemical modeling
Oleg V. Mikhailov* and Denis V. Chachkov

The possibility of the existence of a zinc heteroligand complex with 3,7,11,15-tetraazaporphine and fluoride ion with an oxidation state of Zn(III) which is unusual for the given 3d-element, was shown, and key parameters of molecular structure of the given complex were found in the framework of quantum-chemical modeling by the DFT method with OPBE/TZVP and B3PW91/TZVP levels.

p. 690
Corrigendum to “Synthesis of vitamin B₁₂ derivatives with sodium hydroxymethanesulfinate”
Raida A. Pugina, Elena A. Denisova, Pavel A. Ivlev, Denis S. Salnikov* and Sergei V. Makarov