By covalently linking a core porphyrin to specifically designed two-photon antenna moieties (quadrupolar chromophores based on a fluorenyl core and having electron-donating end-groups), a synergic system allowing efficient singlet oxygen generation upon two-photon excitation in the NIR region is achieved. Thanks to the molecular design, the porphyrin unit retains both its fluorescence and sensitization properties.

Efficient singlet oxygen generation has been achieved under two-photon excitation in the NIR region thanks to efficient FRET from a quadrupolar-based antenna to a core porphyrin which generates both fluorescence and singlet oxygen via energy transfer from its triplet state.

Porphyrin derivatives bearing several functional groups were experimentally synthesized and theoretically analyzed using several electronic structure methods. This study revealed that the substitution of different anchoring groups affect the electronic structure in these compounds, mainly in the LUMO (lowest unoccupied molecular orbital) energy levels reorganization, being the HSE06/DZVP protocol the best methodology to simulate electronic spectra in the analyzed molecules.
pp. 103–109
Ni(II) complex of octasubstituted tetraphenylporphine as a stationary phase for gas chromatography
Vladimir A. Burmistrov*, Alexander S. Semeikin, Gregory V. Kuvshinov, Victor V. Aleksandriiskii, Tatiana V. Lubimova, Sofia A. Kuvshinova and Oscar I. Kolman

The stationary phase on the base of synthesized Ni(II) complex of 5,10,15,20-tetakis(3′,5′-di-2′′-methylbutyloxy)phenyl]porphine was used for chromatographic separation of isomeric methyl- and dimethylpyridines. The high structural selectivity of this sorbent was explained by giving the results of DFT calculation of pyridine derivatives axial complexes with porphyrin Ni(II) complexes.

pp. 110–115
Development of viscometric methods for studying the interaction of various porphyrins with DNA. Part III: Meso-tetra-(3N-alkylpyridyl)porphyrin and its Cu-, Co- and Zn-containing derivatives
Vigen G. Barkhudaryan* and Gayane V. Ananyan

The influence of the relative concentration (r) of cationic meso-tetra-(3N-alkylpyridyl) porphyrin and its Cu-, Co- and Zn-containing derivatives on DNA viscosity.

pp. 116–121
Novel self-assembly with zinc porphyrin via axial coordination for dye-sensitized solar cells
Yu Wu, Qian Zhang, Jia-Cheng Liu*, Ren-Zhi Li and Neng-Zhi Jin

Two new self-assemblies based on two zinc porphyrins (ZnP, x = 1,2) bearing different donor groups bound to anchoring porphyrin (ZnPA) by metal-ligand axial coordination. Then these assemblies were immobilized on TiO₂ electrode surface for impressive improvement of photocurrent response in supramolecular solar cell.

pp. 122–127
Synthesis, singlet oxygen generation, photocytotoxicity and subcellular localization of azobisporphyrins as potentially photodynamic therapeutic agents in vitro cell study
Yunman Zheng, Sizhe Zhu, Lijun Jiang, Fengshou Wu*, Chi Huang*, Zao Ying Li, Ka-Leung Wong*, Zebin Xu and Kai Wang*

Three azobisporphyrins (Por 1, Por 2 and Por 3) were synthesized and characterized. The singlet oxygen generation, photocytotoxicity and subcellular localization of azobisporphyrins were studied. Compared to Por 3, Por 1 and Por 2 exhibit the higher quantum yield of singlet oxygen due to the intermolecular π-π accumulation. The results suggest the hydrophilicity and lipophilicity balance of a photosensitizer play an important role in the photodynamic therapy of cancers.
**pp. 128-134**  
Monohydroxyphthalocyanines as potential precursors to create nanoscale optical materials  
Alexander Yu. Tolbin*, Victor E. Pushkarev, Larisa G. Tomilova and Nikolay S. Zefirov

Low-symmetry monophthalocyanines bearing peripheral hydroxyl are considered as novel starting materials to produce stable H- and J-type dimers and polymers. Specific electronic properties of the target macrocyclic compounds open possibility their use in applied physics to provide good non-linear materials.

**pp. 135-143**  
Tatyana N. Lomova*, Maxim S. Filatov and Mikhail K. Islyaikin

Theoretical and experimental studies of complex formation, chemical stability, and acid-base behavior of thiazolehemihexaphyrane anulated by 1,7,7–thrimetylbicyclo[2.2.1]heptane-[2.3]-1,4-diazabenzene (MeH$_3$) were performed for a detailed description of its fundamental properties.

**pp. 144-151**  
Semiconductive properties of zinc(II)-porphyrinic coordination arrays  
Rahul Soman, Subramaniam Sujatha and Chellaiah Arunkumar*

Newly developed zinc(II) porphyrinic coordination arrays can tunnel the electric current through the crystal lattice confirmed by X-ray crystallographic and scanning tunnelling microscopic studies indicating their conducting behavior; conductivity increases with increase in temperature as evident from the temperature dependent current–voltage analysis.

**pp. 152-157**  
meso-Arylethynyl subporphyrins as efficient and tunable photo-induced electron transfer units  
Won-Young Cha, Juwon Oh, Masaaki Kitano, Atsuhiro Osuka* and Dongho Kim*

The photo-excited state dynamics of meso-arylethynyl-substituted subporphyrins can be controlled by 4-substituent at the arylethynyl group and solvent polarity. Arylethynyl substituted subporphyrins are a promising class of chromophores, whose electron transfer reactions can be easily tuned.