AN OVERVIEW OF SPECIFIC PORPHYRIN DERIVATIVE-INVOLVING STUDIES REPORTED IN A TEN YEAR PERIOD AT THE INTERNATIONAL SYMPOSIUM ON ANALYTICAL AND ENVIRONMENTAL PROBLEMS (ISAEP)

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Abstract
Between 2014 and 2024 Taranu *et al.* presented a total of nine studies relevant to porphyrin chemistry at ISAEP. Four of these were reported in 2014 and describe: a) an electrochemical corrosion protection investigation in acidic medium using pseudo-binary oxides and free-base porphyrins deposited on carbon steel substrate that outlined a maximum inhibition efficiency of 90.66 % for 5-(4-pyridyl)-10,15,20-tris(3,4-dimethoxy-phenyl)porphyrin [1]; b) the evaluation of the fluorescent properties of (5,10,15,20-tetraphenylporphinato) dichlorophosphorus(V) chloride in the presence of the toxic Pb^{2+} which led to an acceptable signal intensity–cation concentration correlation in the 10^{-2}-10^{-6} M $Pb(NO_3)_2$ range [2]; c) the electrochemical study in acidic medium of the corrosion properties of 5,10,15,20-tetratolyl-21H,23H-porphyrin on carbon steel substrate which evidenced an inhibition efficiency of 50% [3] and d) the voltammetric and morphological characterization of glassy carbon electrodes modified with 5,10,15,20-tetra(allyloxy-phenyl)porphyrin [4]. The study published in 2018 concerns the applicability of a hybrid material containing Mn(III)-tetratolylporphyrin chloride and gold nanoparticles as sensor for the determination of 4-aminosalycilic acid [5]. A linear dependence between the hybrid material's absorption intensity and the analyte's concentration was found, with a correlation coefficient of 99.31% in the 2.88 x 10^{-5} M - 8.89 x 10^{-4} M range. The obtaining of 5,10,15,20-tetrakis(4-methoxyphenyl)porphyrin-modified graphite electrodes and the determination of their double-layer capacitance is described in a paper published in 2022 [6]. A highest value of 14.017 mF/cm^2 was determined. A similar study was published in 2023 [7]. It focuses on a graphite electrode modified with a mixture of $Ni_{11}(HPO_3)_8(OH)_6$ and 5,10,15,20-tetrakis(4-methoxyphenyl)porphyrin and results in a double-layer capacitance value of 7.475 mF/cm^2. In the same year, the aggregation behavior of 5,10,15,20-tetrakis(N-methyl-4-pyridyl)porphyrin-Zn(II) tetrachloride drop-casted from different organic solvents was analyzed *via* TEM and a variety of porphyrin aggregates was revealed and reported [8]. Lastly, a paper published in 2024 describes the TEM analysis of an organic-inorganic hybrid nanomaterial with 5-(4-carboxyphenyl)-5,10,15-tris(4-phenoxyphenyl)-porphyrin [9]. All these studies supplement the knowledge relevant to porphyrin chemistry and outline the contemporary scientific importance of porphyrins.

References

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