ABSTRACT

Metallo-porphyrins are highly stable macrocyclic-conjugated systems with remarkable characteristics of efficient light absorption ability in the near-infrared and visible regions of the spectrum, which make them suitable candidates for optoelectronics and photoconductive materials. In this research work, we synthesized a series of free base meso-substituted porphyrin derivatives, namely tetrakis(4-phenyl) porphyrin (TPP), tetrakis(4- octyloxyphenyl) porphyrin (OTPP), tetrakish (4-nitrophenyl porphyrin (TNPP), tetrakish (4-aminophenyl porphyrin) and tetrakis [(p-octyloxy benzylideneamino)] phenyl porphyrin (Schiff base). Furthermore, nickel (II) complexes of these synthesized free base porphyrin were prepared, namely Ni-TPP, Ni-OTPP, and Ni-TAPP. The structure of synthesized compounds were confirmed by ^{1}HNMR, GC-MS, UV-Visible and fluorescence spectroscopy. In this study, a series of meso-substituted porphyrins and their nickel (II) complexes were investigated in order to learn more about how structural and electronic changes affect excited state dynamics. UV-visible and photoluminescence spectroscopy studies demonstrate that meso-substituted free base porphyrins and their nickel (II) complexes absorb light very efficiently in the near-infrared and visible regions of the optical spectrum. As a result, nickel (II) porphyrin complexes can be employed as a catalyst in energy applications.