

## DESIGN OF PHTHALOCYANINES WITH IMPROVED ELECTRO- AND PHOTO-CATALYTIC BEHAVIOUR

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Porphyrin-type molecules such as phthalocyanines (Pcs) are often employed as electro- and photo-catalysts. The combination of phthalocyanine dyes with nanomaterials such as quantum dots, carbon nanotubes, and metal nanoparticles has been shown to improve their photosensitizing and electrocatalytic properties. The different methods of improving electro- and photo-catalytic behavior of the Pc include changing the central metal in the cavity of the Pc and the ring substituents. In photocatalysis, conjugates of Pcs with nanomaterials may be used for the degradation of pollutants and for photodynamic antimicrobial therapy (PACT). PACT is an alternative method to deal with bacterial and fungal infections, which requires a photosensitizer that can be illuminated with light to cause the oxidative destruction of microbial pathogens. In electrocatalysis, the Pc-nanomaterial conjugates enhance electrode activity due to the synergistic effect of these nanomaterials with Pc molecules. The use of Pcs and their conjugates for electroanalysis and photodegradation of pollutants will be discussed.