Synthesis, Characterization, Antibacterial and Oxidation Properties Studies Phthalocyanines

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Phthalocyanine complexes (Pcs) are a class of compounds with two-dimensional delocalized \(\pi\)-electron system and metal-N bonds. Absorption spectral properties of metallophthalocyanines are reported for the first time. The absorption spectra are related not only to the central metal and peripheral substituents, but also to the environment. Phthalocyanine complexes (Pcs) are a class of compounds with two-dimensional delocalized \(\pi\)-electron system and metal-N bonds [1]. In particular, IR spectra should somewhat reflect changes in the configuration of phthalocyanine macrocycles due to the introduction or substitution of a template metal. These effects (metal emergence from the macrocycle plane, molecule bending due to introduction of substituents, and others) can be evaluated by comparing the IR spectra of metal phthalocyanines with the spectrum of an initial metal-free macrocycle playing the role of a natural reference. The objective of this study was to estimate the effects of peripheral substituents and the atomic radius of complexing metal on the structure state of metalphthalocyanines using IR spectrometry. In this study; a new compound was produced from phthalocyanine with general formula MPcX, (M=Cu,Ti), (X= substitution)[4-5]. Ti-phthalocyanine and Cu-phthalocyanine has been synthesized according of reactions (1,2).

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\text{O} + \text{TiO}_2 + (\text{NH}_2)_2 \text{CO} + (\text{NH}_4)_6 \text{Mo}_7 \text{O}_{24} \cdot 4\text{H}_2\text{O} + \text{NH}_4 \text{Cl} \quad \rightarrow \quad \text{TiPcO}
\]

\[
\text{O} + \text{CuCl}_2 + (\text{NH}_2)_2 \text{CO} + (\text{NH}_4)_6 \text{Mo}_7 \text{O}_{24} \cdot 4\text{H}_2\text{O} + \text{NH}_4 \text{Cl} \quad \rightarrow \quad \text{CuPc}
\]

UV–visible spectra and IR spectra of novel metallophthalocyanine is reported. Environmental factors, mainly solvent polarity, affect their spectra are discussed. The Cu, Ti centered phthalocyanines show characteristic absorptions in the Q-band region without splitting, while the iron and magnesium centered phthalocyanines show broadened or splitted peak in this region. The absorption maximum, emission maximum of the studied compounds correlate with solvent polarity well. A new Cu-phthalocyanine was prepared, characterized and tested for biological activity. They are effective against Gram-positive bacteria and/or against Gram-negative bacteria.

REFERENCES