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Surface chemistry of porphyrins and phthalocyanines

J. Michael Gottfried

Philipps-Universität Marburg, Fachbereich Chemie, Hans-Meerwein-Str. 4, 35032 Marburg, Germany

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Abstract

This review covers the surface chemistry of porphyrins, phthalocyanines, their metal complexes, and related compounds, with particular focus on chemical reactions at solid/vacuum interfaces. Porphyrins are not only important biomolecules, they also find, together with the artificial phthalocyanines, numerous technological and scientific applications, which often involve surface and interface related aspects. After a brief summary of fundamental properties of these molecules in the context of surface science, the following topics will be discussed: (1) Aspects of geometric structure, including self-assembly, conformation, mobility and manipulation of the adsorbed molecules. (2) Surface-related changes of the electronic structure and the magnetic properties. (3) The role of the metal center in the surface chemical bond. (4) On-surface coordination reactions, such as direct metalation and coordination of axial ligands. (5) The influence of axial ligands on the surface chemical bond and the magnetic properties.

Keywords: Phthalocyanine; Porphyrin; Self-assembly; Electronic structure; Surface chemical bond; Magnetism

Contents

E-mail address: michael.gottfried@chemie.uni-marburg.de

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