Synthesis, spectra, and structure of differently substituted porphycenes

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Enormous interest in porphyrin and its derivatives is due to the essential role these compounds play in living systems and to numerous possible applications, e.g., in medicine, as laser dyes, catalytic and photocatalytic systems. Constitutional isomers of porphyrin: porphycenes, corphycenes, isoporphycenes proved to be excellent sensitizers for singlet oxygen generation, a feature that makes them attractive candidates for phototherapeutic agents.

Porphycenes substituted at various positions on the periphery reveal significant changes in structure (in particular, in the dimensions of the inner cavity) and spectra. In order to investigate whether the origin of these effects is due to steric or electronic factors, or to the combination of both, we have synthesized variously substituted porphycenes and compared their structural, spectral, and photophysical properties.

![Diagram of porphycenes with substituents](image)

1. R=H, R’=CH₃
2. R=Ph₃C, R’=H