

在光动力光疗中类卟啉稀土配合物光敏作用原初反应的特征:产生自由基I型机制的ESR研究

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摘要 本文用ESR方法研究了类卟啉稀土配合物[(CO₂H-APPC)Gd]Cl₂的光敏反应。用4-hydro-tetramethylpiperidine-N-oxide radical(4-hydro-TEMPO)作探针,通过对其消自旋的作用,证实[(CO₂H-APPC)Gd]Cl₂光敏反应中有阳离子自由基[(CO₂H-APPC)Gd]⁺产生,加入还原剂可促使[(CO₂H-APPC)Gd]⁺生成。经由5, 5-Dimethyl-1-pyrrolineN-oxide(DMPO)对超氧阴离子(O₂⁻)和羟基自由基(.OH)的自旋捕捉及对该自旋加合物[DMPO-O₂⁻]和[DMPO-OH]的ESR测定,证实有O₂⁻和.OH产生,并用SOD清除O₂⁻和甲酸钠清除.OH的实验,进一步证实O₂⁻和.OH的产生。上述结果说明[(CO₂H-APPC)Gd]Cl₂光敏反应存在着产生[(CO₂H-APPC)Gd]⁺和活性氧自由基的I型机制。

关键词 [光敏化](#) [电子自旋共振](#) [卟啉](#) [自由基](#)

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Characterization of the initial photosensitization of porphyrin-like rare-earth metal complex in photodynamic therapy---ESR study of the type I mechanism of free radical production

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Abstract By means of ESR, we studied the photosensitization of porphyrin-like rareearth metal complex [(CO₂H-APPC)Gd]Cl₂. By using 4-oxo-TEMPO as a probe and through its spin elimination, the production of cation free radical [(CO₂H-APPC)Gd]⁺ in [(CO₂H-APPC)Gd]Cl₂ photosensitization was established and moreover it might be promoted by using BNAH as a reducing agent. Through trapping O₂⁻ and .OH with DMPO and measuring the ESR spectra of the spin adducts of [DMPO-O₂⁻] and [DMPO-OH], the O₂⁻ and .OH were found to be definitely generated. These results showed the presence of oxygen radicals in [(CO₂H-APPC)Gd]Cl₂ photosensitization, and shed light on the type I mechanism.

Key words [PHOTOSENSITIZATION](#) [ELECTRON SPIN RESONANCE](#) [PORPHYRIN](#) [FREE RADICALS](#)

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