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材料化学工程与纳米技术

# 吡啶盐染料DEHSPI的合成、结构与光物理性质

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摘要

合成了一种新型吡啶盐染料4-［4-（N，N-二乙胺基）-2-羟基-苯乙烯基］-N-甲基吡啶碘盐（DEHSPI〖HTSS〗）。用X射线衍射方法测定了其晶体结构，DEHSPI单晶属于单斜晶系，C2/c空间群。晶胞参数：a=3.5970（4）nm，b=1.16270（15）nm，c=2.2081（3）nm，β=114.341（7）°，V=8.4139（18）nm3，Z=8，F（000）=3632，μ=1.536 mm-1，Dc=1.417 g·cm-3，R=0.0501。DEHSPI〖HTSS〗与没有羟基取代化合物的晶体结构分析比较发现，分子中2-羟基基团的存在提高了分子阳离子骨架的平面性。研究了它在不同溶剂和聚合物浸泡的溶胶-凝胶复合玻璃基质中的光物理性质，发现在复合玻璃基质中的荧光强度相对于溶液中大大增强，即使掺杂浓度较高时也没有因生成分子的聚集体而发生明显的荧光猝灭，材料的稳定性提高。

关键词

吡啶盐 晶体结构 复合玻璃 光物理性质

分类号

# Synthesis，structure and photophysical properties of pyridinium dye DEHSPI

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**Abstract**

A new organic pyridinium dye named as 4-［4-（N，N-diethylamino）-2-hydroxy-styryl］-N-methylpyridinium iodide（DEHSPI）has been synthesized.Its crystal structure was determined by X-ray diffraction.DEHSPI belongs to monoclinic system，C2/c space group，a=3.5970（4）nm，b=1.16270（15）nm，c=2.2081（3）nm，β=114.341（7）°，V=8.4139（18）nm3，Z=8，F（000）=3632，μ=1.536 mm-1，Dc=1.417 g·cm-3，R=0.0501.The structure analyses of DEHSPI and the dye without 2-hydroxyl group revealed that the planarity of cation backbone in DEHSPI was strongly increased by the 2-hydroxyl group.The photophysical properties of the dye in different solvents and a polymer-impregnated sol-gel composite glass were also investigated.The fluorescence intensity in the composite glass with higher concentration increased greatly as compared with that in solution and there was no fluorescence quenching based on the aggregation of molecules in high concentration.The dye had higher stability in the composite glass.

**Key words**

pyridinium crystal structure composite glass photophysical properties

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