

论文

# 甲壳素类液晶高分子研究——低分子量壳聚糖溶致液晶性及分子量对液晶临界浓度的影响

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**摘要** 研究了两种用酶降解法得到的低分子量壳聚糖样品(CS<sub>1</sub>和CS<sub>2</sub>)的溶致液晶性. 用GPC并辅以质谱法确定了两样品的数均相对分子质量为622和2311g/mol. 在相对分子质量低至622的低分子量壳聚糖(相当于四糖)水溶液中仍发现了溶致液晶现象, 并确定出相对分子质量为622和2311的低分子量壳聚糖液晶临界浓度为73%和36%(W/W%), 这些结果与已报道的中、高分子量壳聚糖液晶临界浓度随分子量升高而降低的基本规律是一致的. 实验结果与经典的KS理论预测值不符, 因为低分子量壳聚糖的相对分子质量超过了KS理论对高分子临界浓度的预测范围.

**关键词** [低分子量壳聚糖](#) [溶致液晶](#) [液晶临界浓度](#)

分类号

## STUDIES ON CHITIN-BASED LIQUID CRYSTALLINE POLYMERS—THE LYOTROPIC LIQUID CRYSTALLINITY OF LOW MOLECULAR WEIGHT CHITOSAN AND THE INFLUENCE OF MOLECULAR MASS ON CRITICAL CONCENTRATION

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**Abstract** The lyotropic liquid crystallinity of two low molecular weight chitosan samples prepared by enzymic decomposition was investigated. The number average molecular masses of those two samples CS<sub>1</sub> and CS<sub>2</sub> were 622 and 2311 g / mol. measured by means of GPC and MS. The lyotropic liquid crystalline behavior was found for these samples when the molecular mass was as low as 622 g / mol (~tetramer). The critical concentration of CS<sub>1</sub> and CS<sub>2</sub> to form liquid crystalline phase was determined to be 73 wt% and 36 wt% respectively. The results agree with the Drincipie rule deduced from chitosans with high and medium molecular mass, which states that the critical concentration increases with the decrease of molecular mass. However the results were not according with those predicted by the traditional Khokhlov. Semenov(KS) theory, because the molecular mass of the samples is out of the region in which KS theory can be used.

**Key words** [Low molecular weight chitosan](#) [Lyotropic liquid crystals](#) [Critical concentration](#)

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