

论文

喹啉羧酸类喹诺酮类抗生素的光促反应特性

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摘要:

目的:探讨喹啉羧酸类喹诺酮类抗生素的光促反应特性。方法:用差示光照量热分析法,并结合HPLC等分析手段,分析光促反应产物产生的时间顺序,比较几个喹诺酮类药的光促反应特性。结果:喹啉羧酸类喹诺酮类抗生素的光促反应为放热反应;在溶液中,光促反应具有自身抑制作用,并可被组氨酸所抑制;光不仅可以使喹诺酮类抗生素分解,而且可能导致药物聚合;分解反应主要和药物7位侧链的哌嗪基有关,且在光照的初期即可发生,而聚合物则需在光照的后期才出现;光促反应为分步反应。结论:1,8-萘啶羧酸类药物较喹啉羧酸类药物都有较强的光反应特性。

关键词: 喹诺酮类抗生素 光降解反应 差示光照量热分析

THE CHARACTERISTICS OF PHOTOLYTIC REACTIONS OF QUINOLONE ANTIBIOTICS

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Abstract:

AIM: To understand the characteristics of photolytic reactions of quinolone antibiotics. METHODS: A differential photo calorimetric technique, together with HPLC and other analytical methods, was used. The rates of photolytic reactions of sparfloxacin, pefloxacin, ciprofloxacin, levofloxacin and enoxacin were compared and the order of the impurities produced in irradiation were analyzed. RESULTS: The photolytic reaction was an exothermic one. In solution circumstance, the photolytic reaction could be auto inhibited and be inhibited by histidine as well. An irradiation could not only induce quinolone antibiotics to degrade, but to polymerize as well. Photodegradation might occur at primary periods of irradiation and the degradation site might be on the piperazine group of quinolone antibiotics at the 7-site. However, the photo polymerization reaction might occur at the late periods of irradiation. The photolytic reaction might be a step reaction. CONCLUSION: The structures of the drugs influenced greatly on the rates of photolytic reaction. Either in the degradation or in the polymerization, the rate of photolytic reactions of the drugs with a 1,8-naphthyridine structure was faster than the drugs with a quinolone structure.

Keywords: photodegradation differential photo calorimetric analysis quinolone antibiotics

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