

研究论文

单分散微/纳米卤化银乳剂的光吸收特性研究——
立方体乳剂和氯化银{100}面扁平颗粒乳剂

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摘要 重点研究了系列立方体乳剂和氯化银{100}面T-颗粒乳剂的光吸收特性. 通过调变乳剂制备的各项参数, 成功地制备了系列立方体卤化银乳剂及氯化银{100}面扁平颗粒乳剂. 经过TEM和SEM进行观察, 统计颗粒的形貌、粒径, 确定系列立方体乳剂微晶的粒径分别为: 80, 150, 600 nm; 得到的氯化银{100}面扁平颗粒乳剂微晶的等效粒径为1400 nm, 且形态比不小于7. 经过对明胶-乳剂层和片基的反射和透射光谱测试, 计算了不同形貌、不同粒径AgCl(Br)乳剂体系的光吸收系数, 比较了相对光吸收能量. 实验发现: 纳米级卤化银立方体的光吸收在可见光谱区始终保持有较高值, 主要吸收峰与其它颗粒相比明显发生了红移; 氯化银{100}面T-颗粒乳剂在本征吸收区及可见光区域都有独特的光吸收性能.

关键词 [氯化银乳剂](#) [纳米尺度](#) [{100}面扁平颗粒](#) [立方体颗粒](#) [光吸收](#)

分类号

Light Absorption Properties of Monodispersed Micron/Nano-sized Silver Halide Emulsions: Cubic Silver Halide and AgCl {100} T-grain

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Abstract A silver chloride {100} T-grain emulsion and a series of cubic silver halide emulsions were prepared by varying the parameters correctly during nucleation and growing processes of grains. After the observation of SEM and TEM, following statistical data were obtained: the diameters of the cubic microcrystal are 80, 150, 600 nm respectively, the equivalent circular diameter (ECD) of the {100} tabular microcrystal is 1400 nm and the shape ratio (ratio of ECD to thickness of a grain) is not less than 7. The absorbencies and the relative absorbed energy of the emulsions were calculated and then compared with each other. It can be easily found that the nano-sized AgX microcrystal retained the high light absorption in visible light region and obtained a red shift of its peak, and the absorbance of the AgCl {100} T-grain emulsion was also particular.

Key words [silver chloride emulsion](#) [nano-sized](#) [{100} face tabular grain](#) [cubic microcrystal](#) [light absorption](#)

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