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A NEW KIND OF WATER-RESISTING COMPOUND RED-SENSITIVE PHOTOPOLYMER FOR HOLOGRAPHY

Qiang Yang[1], Ronghua Zhao[2], Zehua Gao[2], Wei Li[2], Heling Zhang[1] and Xiaojing Hu[1]

[1]yangqiang16@sina.com; Department of Physics,Capital Normal University Beijing China 100037

[2]rhzhao@bupt.edu.cn; Beijing University of Posts and Telecommunications, Key Laboratory of Optical Communication and Lightwave Technologies,Ministry of Education Beijing China 100088

Abstract. The paper studies a new kind of water-resisting red-sensitive photopolymer. The mechanism of the initiation reaction is associative. The photopolymer materials have higher sensitivity, high diffraction efficiency and higher refractive-ratio modulation. The materials which are sensitive to red light $632.8nm$ have the property of waterproof quality, and the holograph image can become clear quickly after simple later-treating course. The experimental evidence indicates that the holographic plate using this kind of photopolymers which can be operated in white light has good holographic characters, so this materials have good practical application value. Besides, we discussed the mechanism of the polymerization and the polymerization ration which is effected by the components. Other characteristics are analysed too.

Keywords. Water- resistibility, compound sensitization, red-sensitive photopolymer (RSP), cations initiation.

1 Introduction

Photopolymers have many unique Photopolymers have many unique characteristics [1, 2, 3], such as the higher refractive-index changes which make them become desirable materials required for holographic recording. The requirement of photopolymers conserving stably in common surroundings is very rigorous, because the temperature, the humidity and the solar light could affect the imaging quality of holograms severely. This phenomenon is concerned with some materials in photopolymers which have performance of water-solubility. Since He-Ne lasers have been used widely in recent years, it is significant to research and develop a kind of water-resisting red-sensitive photopolymer [4, 5].

The red-sensitive photopolymer discussed in this paper is water-resisting. Considering maximizing the sensitivity of photopolymer, combinative photosensitizer and combinative photoinitiator are preferred and the fabrication technology is improved.