

Quantitative diffusion model for holographic optical element recording in DuPont photopolymer

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Paper Abstract

We investigate the recording dynamics of Omnidex photopolymer film from DuPont. We use a reviewed version of the diffusion model proposed by Zhao and Mouroulis in order to describe the recording response, that combine photopolymerization and free monomer diffusion process. Experiments are presented that lead to the determination of material kinetic parameter. These values are introduced in a numerical model to provide quantitative simulation of gratings formation under various holographic exposures. We extend its application to the investigation of film shrinkage influence on refractive index distribution and spectral selectivity of reflection gratings. This study improves the understanding of recording process and consequently allows building more accurate holographic components in this material.

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