

ABSTRACT

Holography has a wide application in medicine, optical computers, scanners among others. Conventional studies on analogue holograms have mainly been conducted on image generation, processing and reconstruction. However, these conditions may vary thus affecting hologram quality. Since conventional holography uses photosensitive recording interference patterns in holographic material, there is a need to evaluate aberration or how high intensity of light has been reconstructed. In this paper, we analyzed the fundamental parameters such as exposure time and processing chemical composition effect in phase holograms. Optimization of these parameters resulted in phase hologram image of approximately 16% diffraction efficiency at an exposure time of 20 s. Moreover, the influence of objective beam polarization is investigated. The results show that by varying the polarization orientation, diffraction efficiency and fringe visibility are greatly affected. Polarized phase hologram of diffraction efficiency of 21.1% has been achieved