

Holographic Fabrication of Encoded Free-floating Photonic Crystal Microparticles

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In recent years, suspension arrays, which use self-encoded microcarriers as elements, are attracting increasing interest in the field of drug discovery, gene-function analysis, clinical diagnosis, and so on. Compared with the conventional microarrays on a plate, suspension arrays may offer greater flexibility in the preparation of new assays, higher diffusional flux of analytes, less consumption of sample and reagents, and higher sensitivity. Photonic crystals have been suggested as a new type of spectrum-encoding carrier, whose code is the characteristic reflection peak originated from the photonic band gap. As the peak position is based on their periodical structure, the code is very stable, and the fluorescent background is low. Here, we reported the novel method for fabricating self-encoded microparticles with different photonic band gap by combining the hot-embossing process and prism holographic lithography. Photonic band gap of individual microparticles can be tuned by controlling laser exposure time, and design of prism geometry.