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**Polybutadiene polymer as a photopatterning substrate** AS-CHALEW KASSU, JEAN MICHEL TAGUENANG, FERNANDO CALZZANI, REDAHEGN SILESHI, ANUP SHARMA, Alabama A&M University — Surface relief gratings produced on planar substrates have been widely investigated for their application as a holographic recording medium. In this work, surface relief holographic gratings are fabricated on polybutadiene-coated walls of a cell filled with an aqueous solution of azo-dye-labeled phospholipid as well as rhodamine 6G. This deposition as a grating pattern is photo-induced in a dye-solution by holographic interference of low power 488 nm light from an argon-ion laser. Dynamics of this aqueous-phase grating deposition is investigated for various concentrations of the dye. A plausible mechanism of grating formation involves photochemical reaction of polybutadiene substrate with the laser-excited dye. Lithographic masks are used to show that photochemical pattern on the substrate is an exact replica of the light intensity distribution and so the technique can be used for holographic recording as well as for biomolecular applications. Surface relief structure of the grating is characterized with an atomic force microscope.

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