

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Polymers containing azobenzene as photo-mechanical materials.

CHRISTOPHER BARRETT, McGill University — Polymers containing Azobenzene have received much interest as photo-reversible materials for a variety of optical and photonic applications. Most recently however, Azo Polymers have also been shown to respond physically and mechanically to light, to act as all-optical patterning materials, and photo-mechanical devices. In particular, a photo-induced pressure in soft amorphous thin films of azo polymers can lead to the facile inscription of efficient surface relief gratings (SRGs) upon irradiation with an interference pattern. Irradiation with CW light is also shown to lead to a reversible photo-expansion of these films, allowing the materials to function as photo-mechanical switches or light-actuators. New azo polymers to optimize this effect will be presented, and some simple macroscopic devices will be demonstrated that take mechanical advantage of this effect for larger scale motion driven by light. The mechanism for this effect will be discussed from studies using ellipsometry, surface plasmon resonance spectroscopy, and neutron reflectometry.

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Date submitted: 21 Nov 2006

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