

**PHOTOTRANSFORMATION OF C₆₀ THIN FILMS BY UV PULSED LASER
IRRADIATION: COMPARATIVE PHOTOACOUSTIC, AFM, AND RAMAN
STUDIES**

E. Alvarez-Zauco^{*}, E. V. Basiuk (Golovataya-Dzhymbeeva), R. Castañeda-Guzmán, R. Y.

Sato-Berrú, J.M. Saniger-Blesa, M. Villagrán-Muniz

CCADET, Universidad Nacional Autónoma de México, Ciudad Universitaria, Coyoacán,

04510 México D.F., México. Phone (52-55) 5622-8602, Fax (52-55) 5622-8651

^{*}e-mail: ezauco@ciencias.unam.mx

Abstract.

Fullerene C₆₀ films deposited by sublimation were irradiated with Kr-F laser in a wide fluence interval from 15 to 40 mJ/cm². In situ photoacoustic analysis was applied to study the phase transformation during the irradiation. The results obtained were discussed in conjunction with atomic force microscopy (AFM) and Raman spectroscopy data. It was found that for a irradiation fluence interval from 22 to 30 mJ/cm², 80% of C₆₀ undergoes photopolymerization (presumably through 2+2 cycloaddition). For a laser energy higher than 30 mJ/cm², a new amorphous carbon phase forms, having a large content of diamond-like, tetra-amorphous carbon (ta-C).