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## Photoinduced Electron Dynamics in A Phosphate Heterostructure Dispersed with C<sub>60</sub>-Nanoclusters

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**Abstract** — Development of a series of lead phosphate heterostructures dispersed with C<sub>60</sub>-nanoclusters which upon 230-400 nm UV irradiation show a phenomenon of electron transfer from the divalent lead centre (Pb<sup>+2</sup>) of the lead phosphate network to the incorporated fullerene, has been reported. Studies of the steady state photoinduced absorption and photoinduced ESR spectra showed formation of Pb<sup>+3</sup> type of hole and C<sub>60</sub>-nanocluster anions in the irradiated composite. The charge separated state thus formed has life time ranging from few hours to days, which is higher than those hitherto reported for various cased donor acceptor systems. An analysis of the carrier-dynamics suggests that the photoinduced migration of electrons from the hole-sites to the fullerene sites involves two steps : 1) Trapping of the electrons released from the Pb-sites by the UV, within the phosphate-network and 2) Detrapping and tunneling of these electrons from the trap sites to the fullerene sites by the electron-scavenging effect of the latter.