ASSIGNMENT OF THE LOWEST EXCITED STATES OF C_{70} AND EVIDENCE FOR FLUORESCENCE FROM THE SINGLET S_2 STATE

A. SASSARA, G. ZERZA and M. CHERGUI, *Institut de Physique Expérimentale, Université de Lausanne, CH-1015 Lausanne-Dorigny, Switzerland*.

Highly structured fluorescence, phosphorescence and fluorescence-excitation spectra of C_{70} in neon matrices are reported. Fluorescence from both S_1 and S_2 states is observed and these are identified as being of A_2' and E_1' symmetry and have gas phase energies estimated at 15560 and 15725 cm^{-1}, respectively. A third singlet state is identified in the excitation spectrum and is proposed to be of A_2'' symmetry with an estimated gas phase energy of 16000 cm^{-1}. Finally, the phosphorescence is dominated by vibrational bands of e_1' symmetry pointing to a lowest triplet state of A_2' symmetry. Its energy lies at 12588 cm^{-1}above that of the ground state in the neon matrix. From a comparison with data from the literature, the existence of a second triplet state of E_1' character is inferred, which lies about 165 cm^{-1}above the lowest triplet state, i.e. with the same energy separation as the lowest two singlet states.