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Study of Electronic Absorption and Emission Spectra of C_{60} and C_{70} Molecules in Organic Solvents

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The interesting third form of carbon atom was discovered by Kroto, Curl and Smalley and got Nobel prize in 1996. They demonstrated that laser vaporization of graphite in a high pressure supersonic nozzle produced a remarkably stable C_{60} cluster and small amount of C_{70} . One of the first of many physical properties investigated was the UV visible absorption spectra. At present we are reporting the electronic absorption spectra of C_{60} and C_{70} molecules in various solvents viz., polar, aliphatic and aromatic. The electronic absorption spectra of C_{70} have more bands in visible region as compared to C_{60} . For the analysis of many organic compounds, molecular fluorescence is one of the most sensitive methods as compared to spectrophotometric method. This technique has greater sensitivity as emitted radiation is measured directly and can be increased or decreased by varying the intensity of an exciting radiation. We have studied fluorescence spectra of C_{60} and C_{70} molecules using conventional spectrofluorometer and a Laser Induced Fluorescence (LIF) set-up. For spectroscopic measurements, benzene as solvent is chosen. As compared to other solvents their quantum yields are slightly different. The emission spectra of C_{60} and C_{70} in different organic solvent are obtained by LIF is compared to the spectra recorded by spectrofluorometer.

Keywords: C_{60} and C_{70} molecules, electronic absorption spectra, Fluorescence, Laser Induced Fluorescence (LIF)

Biography:

Dr. Sonia Bansal completed her MSc and PhD in Physics from Jamia Millia Islamia, New Delhi, where she worked on Spectroscopic studies of Buckminsterfullerene. In 2005, she joined YMCA University of Science and Technology, Faridabad, India, where she is currently a faculty member in Physics at YMCAUST, Faridabad. Her research interests include the study of optoelectronic properties of ZnO, Application of defected CNT and Graphenes. She received the research grant for structural analysis of doped and undoped ZnO nano structures from Department of Science and Technology (DST), Haryana. Apart from this, she is having M.Tech degree in Computer Engineering and working on Theoretical & Computational Studies of Nano-structures.