Charge Density Level Structures of Endohedral Metallofullerenes Determined by Synchrotron Radiation Powder Method

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The recent X-ray structural studies of endohedral metallofullerenes by synchrotron radiation (SR) powder diffraction utilizing the maximum entropy method (MEM) are reviewed. Results for endohedral metallofullerenes (Y@C82, La@C82, Sc@C82, Sc2@C84, Sc3@C82, Sc2@C66, La2@C80 and Sc3C2@C82) are given. The precise MEM charge densities of metallofullerenes present direct images of the endohedral nature of metallofullerenes and reveal the features of the charge transfer from metal atoms to a carbon cage, which governs the stability of the unique endohedral structures. The MEM/Rietveld method, which is the crucial method for structural determination of endohedral metallofullerenes based on SR powder data, is also described in some detail.