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Redistribution of Ce 4d Oscillator Strength Observed in Photoionization of Endohedral Ce@C_{82}^+ Ions A. MÜLLER, S. SCHIPPERS, Justus-Liebig-University Giessen, Germany, M. HABIBI, D. ESTEVES, R.A. PHANEUF, University of Nevada, Reno, A.L.D. KILCOYNE, A. AGUILAR, Advanced Light Source, Lawrence Berkeley National Laboratory, L. DUNSCH, Leibniz-Institut fuer Festkoerper- und Werkstoffforschung Dresden, Germany — The concept of an atom trapped inside a fullerene molecule has fascinated both chemists and physicists for the past two decades. Numerous theoretical studies have explored the response of atoms encapsulated in fullerene cages to ionizing electromagnetic radiation. We report on single and double photoionization experiments[1] with free atomic Ce^{q+} (q=2,3,4), empty C_{82}^+ and endohedral Ce@C_{82}^+. From the measured cross sections the contributions of cerium $4d$ photoexcitation to the single and double ionization channels of the endohedral molecule have been extracted as well as information about the charge state (q=3) of the cerium atom residing within the fullerene shell. Comparing $4d$ photoionization of free and encasulated Ce^{3+} we find a considerable reduction of the oscillator strength for the encaged ion. We speculate that this may be due to the redistribution of oscillator strength into additional (yet unmeasured) decay channels of the endohedral fullerene ion which are not availabale for the free atomic ion.

[1]A. Müller et al., PRL 101, 133001 (2008).

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