

## TUNNELING SPECTROSCOPY ON SMALL ENDOHEDRAL METALLOFULLERENES

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We report on scanning tunneling spectroscopy on deposited endohedral fullerenes with  $\leq 60$  carbon atoms ( $M@C_{2n}$ ;  $M=Ce,La,Y$ ). The metallofullerene clusters have been produced in a laser vaporisation plasma source and deposited on HOPG from a mass selected cluster beam. STS data have been taken on individual clusters by a variable temperature STM. The normalised differential conductivity reveals information on the local density of states immediately below and above the Fermi energy. From the STS data it is obvious that endohedrally-doped  $C_{60}$  on HOPG is metallic upon doping with Y and La while  $Ce@C_{60}$  shows a HOMO-LUMO gap of approximately 0.5 eV.  $Ce@C_{36}$ , as the smallest explored metallofullerene, shows a metallic-like density of states. Similar,  $Ce@C_{44}$  seems to be metallic when deposited on HOPG while  $Ce@C_{50}$  on HOPG has a HOMO-LUMO gap of approximately 0.8 eV. Assuming a trivalent lanthanoid metal the semiconducting character of  $Ce@C_{50}$  is explained by an on-site Coulomb repulsion similar to a Mott-Hubbard insulator.