

Isolation and Characterization of Novel Lanthanum Metallofullerene

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Since the first extraction of $\text{La}@\text{C}_{82}$,¹ endohedral metallofullerenes have attracted special attention for their unique structures and novel properties which can't be expected from empty fullerenes.²⁻⁵ Especially, the cage structures of endohedral metallofullerenes are very interesting. Lanthanum endohedral fullerenes such as $\text{La}@\text{C}_{82}$,^{1,6,7} $\text{La}_2@\text{C}_{80}$ ³ are known as the typical representatives of those novel materials. Here we report the first isolation and characterization of a new lanthanum metallofullerene.

References

- (1) Chai, Y.; Guo, T.; Jin, C.; Haufler, R. E.; Chibante, L. P. F.; Fure, J.; Wang, L.; Alford, J. M.; Smalley, R. E. *J. Phys. Chem.* **1991**, *95*, 7564.
- (2) Akasaka, T.; Nagase, S. *Endofullerenes: A New Family of Carbon Clusters*; Kluwer Academic Publisher: Dordrecht, 2002.
- (3) Akasaka, T.; Nagase, S.; Kobayashi, K.; Waelchli, M.; Yamamoto, K.; Funasaka, H.; Kato, M.; Hoshino, T.; Erata, T. *Angew. Chem., Int. Ed. Engl.* **1997**, *36*, 1643.
- (4) Cao, B.; Hasegawa, M.; Okada, K.; Tomiyama, T.; Okazaki, T.; Suenaga, K.; Shinohara, H. *J. Am. Chem. Soc.* **2001**, *123*, 9679.
- (5) Stevenson, S.; Rice, G.; Glass, T.; Harich, K.; Cromer, F.; Jordan, M. R.; Craft, J.; Hadju, E.; Bible, R.; Olmstead, M. M.; Maitra, K.; Fisher, A. J.; Balch, A. L.; Dorn, H. C. *Nature* **1999**, *401*, 55.
- (6) Akasaka, T.; Wakahara, T.; Nagase, S.; Kobayashi, K.; Waelchli, M.; Yamamoto, K.; Kondo, M.; Shirakura, S.; Okubo, S.; Maeda, Y.; Kato, T.; Kako, M.; Nakadaira, Y.; Nagahata, R.; Gao, X.; Caemelbecke, E. V.; Kadish, K. M. *J. Am. Chem. Soc.* **2000**, *122*, 9316.
- (7) Akasaka, T.; Wakahara, T.; Nagase, S.; Kobayashi, K.; Waelchli, M.; Yamamoto, K.; Kondo, M.; Shirakura, S.; Maeda, Y.; Kato, T.; Kako, M.; Nakadaira, Y.; Gao, X.; Caemelbecke, E. V.; Kadish, K. M. *J. Phys. Chem. B* **2001**, *105*, 2971.