Title: Grating of single $Lu@C_{82}$ molecules using supramolecular network

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Supporting information:

Characterization of the Lu@C82 molecules:

The purity of the Lu@C82 molecules has been checked by mass spectrometry and by UV-Vis-NIR absorption.
Fig.1 shows the positive mass spectrum on the isolated Lu@C82, HPLC fraction.
The corresponding negative mass spectrum is presented Fig.2.
The mass spectra were taken with the MALDI technique without any matrix.
Fig.3 shows UV-Vis-NIR absorption spectra for isolated Y@C82, La@C82 and Lu@C82 for comparison. The fullerenes were in suspension in CS2 solution during the recording of the UV-vis-NIR spectra.

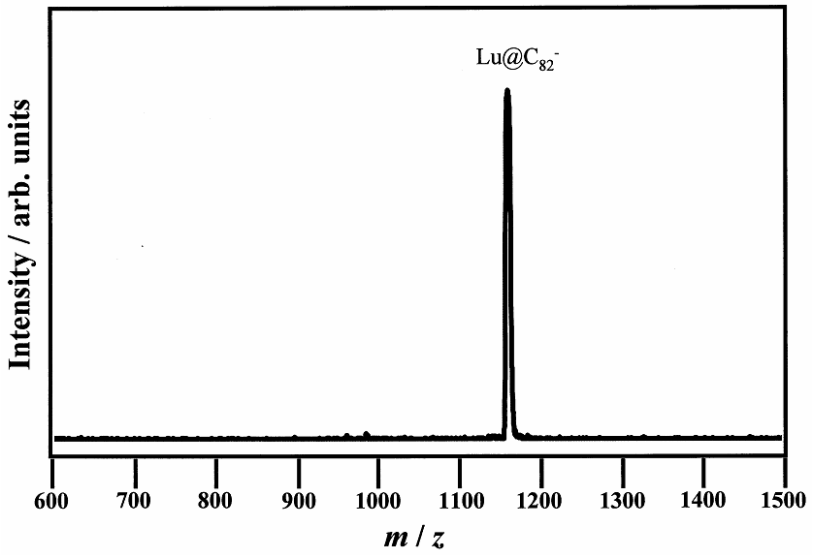

Fig.1: Positive mass spectrum on the isolated Lu@C82

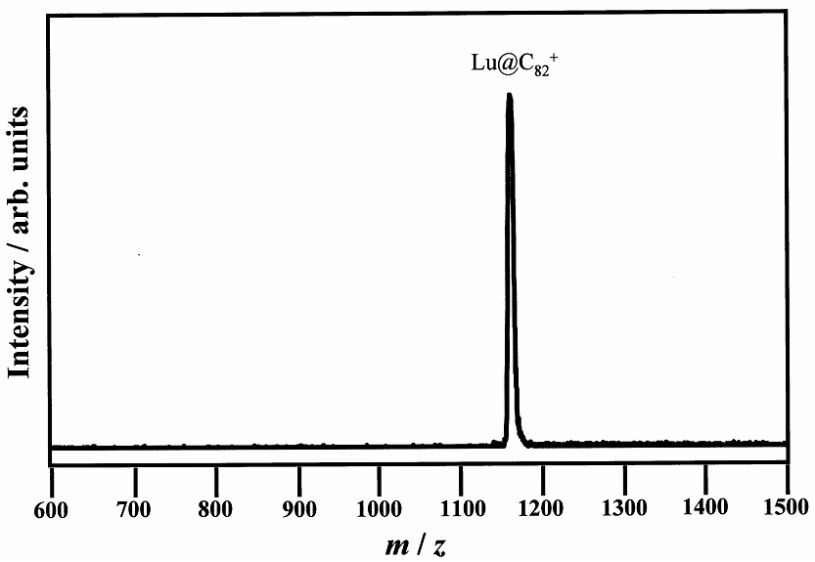

Fig.2: negative mass spectrum on the isolated Lu@C82

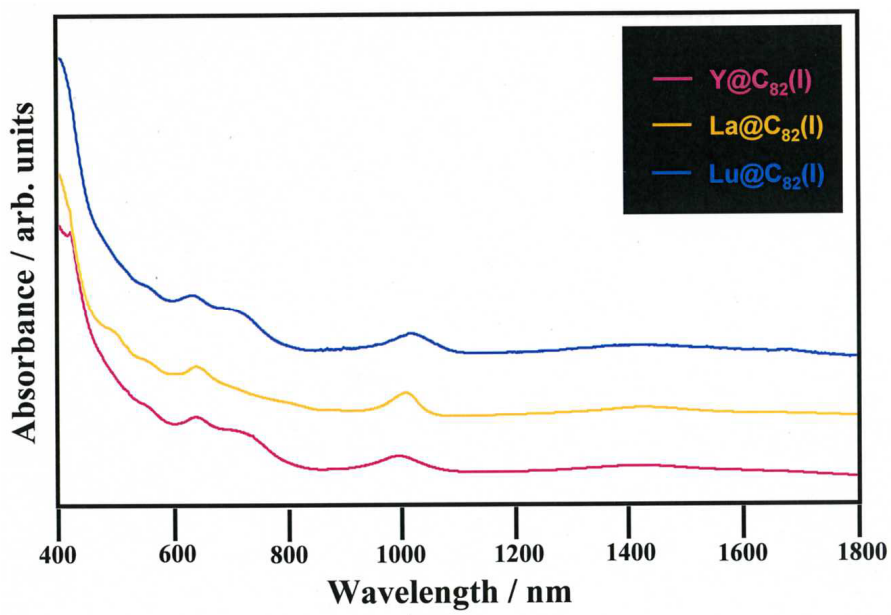

Fig.3: UV-Vis-NIR absorption spectra for isolated Y@C82, La@C82 and Lu@C82.

Procedure to form the Lu@C82-PTCDI-melamine network:

In a first step, PTCDI molecules have been sublimated onto a room temperature gold substrate.
In a second step, the melamine molecules have been sublimated onto this room temperature substrate.
In a third step, the gold substrate supporting the PTCDI and melamine molecules has been annealed at 150°C for 10 h to form the PTCDI-melamine supramolecular network.
Once the substrate has been cooled down to room temperature, the Lu@C82 molecules have been sublimated. No post annealing has been performed after this step.

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Procedure to form the Lu@C82 close-packed domains:

The $Lu@C_{82}$ molecules have been sublimated onto a room temperature gold substrate. No post annealing has been performed after this step.