Attachment of Pristine C\textsubscript{60} to Functionalised Silica Nanoparticle Surfaces: A Thiol-Ene Click Chemistry Approach

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The area of Fullerene chemistry generates great attention due to its applications optoelectronics and its exceptional mechanical properties.[1-3] It is well known that pristine C\textsubscript{60} is incompatible with most systems in its native state, where tailor made derivatives have been made to meet the requirements of specific systems, in which both the physical and chemical properties of the C\textsubscript{60} moiety are not compromised.[4, 5]

Whilst being fairly electronegative, it has been established that C\textsubscript{60} behaves as an electrophile and is susceptible to nucleophilic addition by primary or secondary amines.[6] As an electron deficient alkene it is expected that C\textsubscript{60} would be a good candidate for Thiol-Ene click chemistry, in which nucleophilic addition occurs from alkylthiol sources.

In this talk we introduce novel particle preparations that utilize the Thiol-Ene Click Chemistry approach to covalently attach C\textsubscript{60} to thiol-terminated silica nanoparticles, as well as discuss different analytical techniques used to confirm covalent attachment.

The thermal stability and non-toxicity of both C\textsubscript{60} and silica nanoparticles makes this hybrid material an attractive candidate for use in biological matrices as well as thermally resistant composite materials.

References