Chemical Transformation of C₆₀ Cluster in Aqueous Phase by Oxidants and UV Irradiation

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Professor Jae-Hong Kim and Professor Joseph Hughes at Georgia Institute of Technology reported that water stable C₆₀ colloidal aggregate (termed nC₆₀) undergoes chemical derivatization due to reaction with ozone, hydroxyl radical or short-wavelength UV irradiation. These reactions led to formation of water-soluble, molecularly dissolved fullerene oxides. Figure 4.x shows dissolution of nC₆₀ in water as a result of reaction with ozone.

The toxicological effect of reaction product was further found to vary depending on the oxidation process. Ozone treated C₆₀ was found to be able to penetrate into *Escherichia coli* and produces hydroxyl radical as a main agent for cell inactivation. In contrast, UV treated C₆₀ was found to be less toxic than its parent compound, nC₆₀.

References/Publications

