



**Wolfson Department of Chemical Engineering Seminar
Lecture Hall 6, Wolfson Department of Chemical Engineering,
Wednesday May 23rd at 1:30pm**

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Photoactivity Study on Graphitic Carbon Nitride

Graphitic carbon nitride (g-CN) has attracted an increasing interest due to its promising photoactive properties that may be potentially applied in the areas of photocatalysis, water splitting and photovoltaics. While its preparation is inexpensive and facile, it was found that minor changes in its preparation scheme might affect considerably its properties.

In what follows we present a new method, developed in our group, for studying transient changes in g-CN following photonic excitation. This method is characterized by the ability to obtain photo-induced changes in the FTIR spectrum of the material at a temporal resolution of a few nanoseconds. By performing nanosecond time-scale measurements, one can identify localized phenomena in photoactive samples. The method is quite different from conventional FTIR, where the temporal resolution is in the order of seconds.

Graphitic carbon nitride is an excellent model system to studying the just-developed technique, as it is a photoactive material having well-defined FTIR spectrum and absorbs the excitation light at 355nm wavelength. Intriguing relations between TR-FTIR spectral changes and different aspects of photocatalytic activity were found. These include specific spectral changes beginning immediately after excitation which decay within 150 nanoseconds. The changes are not only functional-group dependent but also depend upon the preparation scheme (in particular preparation temperature) as well as upon surface treatment. A comparison between the transient spectral phenomena and photocatalytic activity in the degradation of p-nitrophenol will be presented.