

CBC SEMINAR ANNOUNCEMENT



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Gas Phase Kinetics and Spectroscopy Relevant to Atmospheric and Combustion Processes

Measurement of kinetic parameters is a challenging task, especially when the reactions take place in the timescales of micro to femtoseconds. Conventional tools may not be of great use, given the criticality of the situation. Reactions between radicals and stable molecules, radicals and radicals are extremely difficult to carry out and measure the kinetics. Usually, kinetics are studied by measuring the concentration of one of the species involved in the reaction with respect to the time under given parameters such as temperature pressure etc., in conventional methods. The comfort of measuring the concentrations will be missing, when one wants to measure the kinetics between radicals. In such events, measurement of a physical property of one of the reactant is of a good choice, which can be used indirectly to measure the concentration of the species under investigation. The properties such as fluorescence or induced fluorescence can be measured using advanced spectroscopic tools. Now-a-days, the spectroscopic tools are supersensitive and can be used to measure a species with concentrations in the range of parts per million to trillion, which means with a variation of six orders of magnitude with excellent signal to noise ratios.

In the present talk, the ultra-super sensitive and unique technique called Cavity Ring Down Spectroscopy (CRDS) will be introduced and the measurement of kinetics where radicals are involved will be demonstrated. In this technique, the effective optical path length is increased to a minimum of 20 km in a one meter Fabry Perrot cavity makes the technique ultra-super sensitive. The applications of CRDS will be demonstrated in the present talk. In addition, measurement of kinetic parameters using Laser Induced Fluorescence (LIF) and relative rate methods will be presented. Measurement of kinetic parameters at elevated temperatures relevant to combustion behind the shock waves will also be presented. Overall, this talk will give a very detailed and broad idea to the audience about the laboratory measurements of kinetic parameters of the reactions relevant to the atmospheric and combustion.

Date: 18th July 2019 (Thursday)
Time: 11.00am to 12.30pm
Venue: SPMS Graduate and Research
Conference Room
Host: Associate Professor Richard Webster