IN SITU SPECTROSCOPIC DIAGNOSTIC OF SHOCK INDUCED DECOMPOSITION OF C_{60}

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The applications of the shock wave research are multi modal. The potential of the shock wave is a large amount of energy is transferred to the material within a very short timescale, leading to the formation of new chemical species and the kinetics of product formation can be studied.

Far from the laboratory, shock waves play an important role in controlling the physical and chemical evolution of the interstellar medium (ISM). In the ISM, shock waves are generated due to supernovae explosions, bipolar outflows and stellar winds. However, the application of shock waves to study the chemistry of the ISM is a relatively new area of research. One of the objectives of our research is to identify new possible shock tracers in the low velocity shocked regions of the ISM.

Shock induced decomposition of C_{60} (one of the interstellar building blocks of dusts) was explored in situ with the help of a UV-Vis spectrometer and a monochromator. The integrated emission spectrum reveals the presence of C_2 features with a broad continuum and was affected by self-absorption. The broad continuum is likely due to the combined effect of the black-body emission from small carbon particles and the recurrent fluorescence of various carbon clusters produced via the dissociation of C_{60}. The emission spectrum of C_2 was computed using Exocross module and the column density of the C_2 units were determined.