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Femtosecond laser ablation of solid methane

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The laser ablation of graphite has been extensively studied because of graphite's unique properties. It is well known that the laser ablation of graphite with nanosecond pulses produces pure carbon clusters and fullerenes such as C50, C60 and C70 as well as more complex species including nanotubes, depending on ablation conditions. It is then important to investigate the ablation of molecular systems containing C-H sigma bonds using femtosecond laser pulses in order to see the effect of hydrogenation of the target molecule. The use of femtosecond, rather than nanosecond laser pulses eliminates heating of the target. Alkanes are the simplest fully hydrogenated C-H molecular systems that occur naturally and methane (CH4), containing only C-H sigma bonds, is the simplest member of this family. A study of the ablation of solid me-thane is then important in understanding ablation in more complicated alkane systems. Experiments were carried out on solid methane, hexane and other alkane solids.

Biography

A A Zaidi obtained PhD from university of waterloo in 2010 studying laser–matter interactions and using time of flight mass spectrometry and Raman spectrometry as analytical tools. I developed time of flight mass spectrometer to study gas phase ionization due to interaction of focused laser light and gas in chamber at a low pressure. During my PhD I also studied organic liquids irradiation by femtosecond laser and separation of irradiation products by using mass spectrometry. During my Postdoctoral study I studied interaction of femtosecond laser with organic solids both at room temperature and in cryogenic state. I also studied stability of carbon-carbon bond in femtosecond laser fields, results of this study were established by using mass spectrometry. I am currently working on understanding of larger molecular formations assisted by femtosecond laser irradiations of cryogenic carbon based solids. Currently I am working as Assistant professor of Physics at Prince Sultan University in Riyadh and research associate during summer semester at University of waterloo in Canada.

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