FTIR OBSERVATION OF SILICON-CARBON CLUSTERS FORMED IN Ar MATRICES BY LASER ABLATION

XIANDE DING, SHUNLIN WANG, C. M. L. RITTBY AND W. R. M. GRAHAM, *Department of Physics, Texas Christian University, Fort Worth, TX 76129*.

Silicon-carbon clusters, which are of interest as astrophysical molecules and as species involved in chemical vapor deposition and semiconductor fabrication, have been produced by pulsed Nd-YAG laser evaporation of silicon/carbon rods. Well resolved FTIR vibrational spectra of the products trapped in an argon matrix around 10K indicate that this laser ablation technique can produce substantial abundances of linear carbon clusters, as well as many small silicon-carbon clusters such as SiC_2, Si_2C, Si_2C_3 and SiC_4. In addition new absorptions, which are believed to belong to long carbon chains terminated by single silicon atoms, have been observed. Extensive carbon-13 isotopic shift measurements have been made to assist in the identification of these novel silicon-carbon clusters. Experimental measurements will be compared with ab initio calculations.