

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Investigation of the SH formation mechanism in Hot Filament CVD of diamond thin film by CRDS VLADIMIR MAKAROV, University of Puerto Rico, Dept. of Chemistry, MADALINA BUZAIANU, ARTURO HIDALGO, University of Puerto Rico, Dept. of Physics, BRAD WEINER, University of Puerto Rico, Dept. of Chemistry, GERARDO MORELL, University of Puerto Rico, Dept. of Physics — The SH radical formation mechanism during the Hot Filament CVD (HFCVD) of diamond thin film was studied using Cavity Ringdown Spectroscopy (CRDS) for the CH₄/ H₂ mixture upon addition of traces amounts of H₂S. The absorption spectrum of the SH radical as function of different parameters (filament material, distance between filament and probing laser area of CRD cell, CH₄ and H₂S concentrations, presence and absence of substrate) was studied. The gas temperature and the SH concentration profiles were obtained. The SH radical yield saturates for CH₄ concentrations higher than 4 %. From the analysis of the experimental data we expect to understand the sources and the decay channels related to the mechanism of the SH radical formation during the HFCVD of the diamond thin film. The SH translational (Doppler analysis of the line countur), rotational (rotationally resolved spectrum fitting) and vibrational (measurement of the relative populations of SH on the $v'' = 0$ and $v'' = 1$ vibronic states) temperatures were estimated.

Vladimir Makarov
University of Puerto Rico, Dept. of Chemistry

Date submitted: 02 Nov 2006

Electronic form version 1.4