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CS radical formation in the Hot Filament CVD of diamond thin film by the CRDS MADALINA BUZAIANU, University of Puerto Rico, Dept. of Physics, VLADIMIR MAKAROV, University of Puerto Rico, Dept. of Chemistry, 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 — In the present study, the CS radical was detected using Cavity Ringdown Spectroscopic (CRDS) during the Hot Filament CVD growth of diamond thin film for the CH_4 / H_2 mixture doped with H_2S. The absolute absorption optical density of the CS radical was obtained, and the concentration of this radical was estimated as function of CH_4 and H_2S concentrations. It was found that the yield of the CS radical depends on the presence of the substrate. The experimental results show that the heterogeneous sources of the CS radical are more significant in the presence of the substrate than in experiments without substrate. The relationship between the homogeneous and heterogeneous channels of the CS radical generation was estimated for both cases with and without substrate. The translational (Doppler analysis of the line contour) and rotational (fitting of the rotationally resolved CS spectrum) temperatures were estimated.

Madalina Buzaianu
University of Puerto Rico, Dept. of Physics

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