

Abstract Submitted  
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**$C_2^-$  Formation By Resonant Dissociative Electron Attachment to Acetylene**<sup>1</sup> S.T. CHOUROU, A.E. OREL, Department of Applied Science, UC Davis — Experimental work on dissociative electron attachment (DEA) of acetylene shows a peak in the cross section at around 8.1 eV corresponding to the formation of  $C_2^-$  anions. It has been further predicted that these anion fragments result from the decay of a series of Feshbach resonant states with the configurations  $^2(\pi_u, 3s^2)$ ,  $^2(\pi_u, 3s3p\sigma)$ ,  $^2(\pi_u, 3s3p\pi)$  and  $^2(\pi_u, 3p^2)$  between 7 and 9.5 eV. In this work, we perform electron scattering calculations using the Complex Kohn Variational Method to determine the positions and autoionization widths of the Feshbach resonances. We iterate this process for relevant geometries of the molecule to construct the multidimensional complex potential energy surfaces. In order to study the dissociation dynamics leading to the ( $C_2^- + H + H$ ) and ( $C_2^- + H_2$ ) rearrangements, we treat the system in 4D taking into account the stretching and bending of the two C-H bonds of  $C_2H_2$  in an appropriate coordinate system. By computing the flux of the wavepacket into the decoupled asymptotic regions associated with these two rearrangements, we deduce the DEA cross section and compare it to available experimental results.

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