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Dynamics of Low-Energy Electron Induced Reactions in Condensed MICHAEL BOYER, CHANMYAEMYAE SOE, KRISTAL CHAMBERLAIN, YOMAY SHYUR, CHRISTOPHER ARUMAINAYAGAM, Wellesley College — We present insights into the dynamics of low-energy electron-induced reactions in thin films of methanol (CH_3OH). Low-energy electrons in matter can initiate chemical reactions through electron impact ionization of a molecule, electron impact excitation of a molecule, or through dissociation of a transient negative ion formed by electron attachment to a molecule. Our studies focus on the dynamics by which low-energy electron interaction with condensed methanol initiates chemical reactions which lead to the formation of methoxymethanol ($\text{CH}_3\text{OCH}_2\text{OH}$) and ethylene glycol ($\text{HOCH}_2\text{CH}_2\text{OH}$). The results of our post-irradiation temperature programmed desorption experiments indicate that both products can form from irradiating methanol with electrons at subionization energies. In addition, we find evidence that dissociative electron attachment plays a role in the formation of methoxymethanol but not in ethylene glycol.

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