

Abstract Submitted  
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**Non-adiabatic Interactions in Reduced Graphene Oxide**<sup>1</sup> MUGE ACIK, GEUNSIK LEE, KYEONGJAE CHO, YVES J. CHABAL, Department of Materials Science and Engineering, University of Texas at Dallas — Thermal reduction of Graphene Oxide (GO) has been studied using infrared absorption spectroscopy to evaluate the reduction pathways, including oxygen and carbon removal. GO is an insulator due to the presence of various oxygen species. Thermal reduction of GO leads to oxygen incorporation in the basal plane at the edges. Upon annealing to 850 °C in vacuum, a strong IR band is observed at  $\sim 800\text{ cm}^{-1}$ , assigned to the remaining ether oxygen ( $\sim 5\text{-}8\text{ at}\%$ ) located at the edges. The strength of its C-O-C asymmetric stretch is due the modulation of extended electronic states associated with the presence of oxygen in the vicinity of the Fermi level. This strong non-adiabatic interaction leads to intensity enhancement of 10-100 times larger than purely vibrational modes.

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Muge Acik  
Dept of Materials Science and Engineering, University of Texas at Dallas

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