

Abstract Submitted  
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**Detection of ionized gas molecules in air by graphene and carbon nanotube networks**<sup>1</sup> JI HAO, Department of Mechanical and Industrial Engineering, Northeastern University, BO LI, Department of Mechanical Engineering, Villanova University, HYUN YOUNG YUNG, Department of Energy Engineering, Gyeongnam National University of Science and Technology, FANGZE LIU, Los Alamos National Laboratory, SANGHYUNG HONG, YUNG JOON JUNG, Department of Mechanical and Industrial Engineering, Northeastern University, SWASTIK KAR, Department of Physics, Northeastern University — The liquid phase ions sensing by graphene and carbon nanotube has been demonstrated in many publications due to the minimum gate voltage easily shift induced by ionic gating effect, but it is still unclear for vapor phase ions sensing. Here we want to report that the ionized gas molecules in air can be also very sensitively detected by graphene and carbon nanotube networks under very low applied voltage, which shows the very high charge to current amplification factor, the value can be up to  $10^8$  A/C, and the direction of current-change can be used to differentiate the positive and negative ions. In further, the field effect of graphene device induced by vapor phase ions was discussed.

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