

Accepted Manuscript

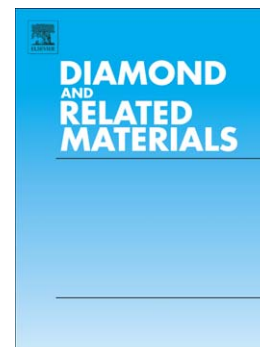
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PII: S0925-9635(15)30050-9
DOI: doi: [10.1016/j.diamond.2015.10.001](https://doi.org/10.1016/j.diamond.2015.10.001)
Reference: DIAMAT 6472

To appear in: *Diamond & Related Materials*

Received date: 7 June 2015
Revised date: 26 August 2015
Accepted date: 1 October 2015



Please cite this article as: S.H. Michaelson, M. Chandran, A. Hoffman, Evidence for D₂ dissociative chemisorption and electron affinity changes of bare and ion beam damaged polycrystalline diamond surfaces, *Diamond & Related Materials* (2015), doi: [10.1016/j.diamond.2015.10.001](https://doi.org/10.1016/j.diamond.2015.10.001)

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Evidence for D₂ dissociative chemisorption and electron affinity changes of bare and ion beam damaged polycrystalline diamond surfaces

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Abstract

Polycrystalline diamond films surfaces were in-situ annealed and 1 keV Ar⁺ implanted to achieve bare and ion beam damaged surface. These films were exposed to D₂ gas and C-D bonding was monitored by high resolution electron energy loss spectroscopy. Our experimental results clearly show the preferential dissociative D₂ adsorption onto the low hybridized carbon (sp/sp²) states with activation temperature as low as at RT. Ultra-violet photoelectron spectroscopy provides clear evidence of electron affinity decrease of bare and damaged diamond surface after exposure to molecular deuterium at RT.

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