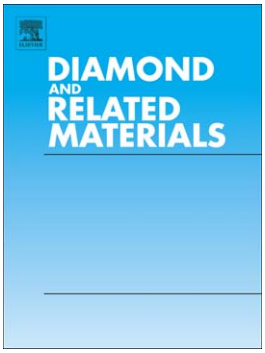

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Evidence for D_2 dissociative chemisorption and electron affinity changes of bare and ion beam damaged polycrystalline diamond surfaces

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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 D_2 gas and C-D bonding was monitored by high resolution electron energy loss spectroscopy. Our experimental results clearly show the preferential dissociative D_2 adsorption onto the low hybridized carbon (sp/sp^2) 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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