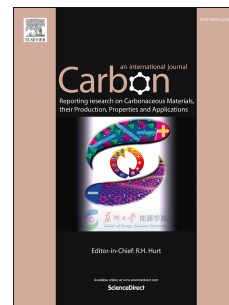


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Redox agent enhanced chemical mechanical polishing of thin film diamond

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Abstract

The chemical nature of the chemical mechanical polishing of diamond has been examined by adding various redox agents to the alkaline SF1 polishing slurry. Three oxidizing agents namely, hydrogen peroxide, potassium permanganate and ferric nitrate, and two reducing agents, oxalic acid and sodium thiosulfate, were added to the SF1 slurry. Oxalic acid produced the fastest polishing rate while hydrogen peroxide had very little effect on polishing, probably due to its volatile nature. X-ray photoelectron spectroscopy (XPS) reveals little difference in the surface oxygen content on the polished samples using various slurries. This suggests that the addition of redox agents do not increase the density of oxygen containing species on the surface but accelerates the process of attachment and removal of Si or O atoms within the slurry particles to the diamond surface.

Keywords: Chemical mechanical polishing, diamond

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