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Structural evaluation of plasma treated electroless Ni-P coatings

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Abstract- Heat treated electroless Ni-P coatings have high hardness and wear resistance. Traditional heat treatment (1 hr at 400 °C under neutral atmosphere), results in full crystallization of electroless Ni-P coatings. In the present research, electroless Ni-P coatings were treated under conventional as well as plasma conditions. Coating thickness was 5 and 10 micron. Temperature rates and time of the processes were decided to be at 400 °C and 600 °C for 1 and 5 hours, respectively. Thickness, structure, and composition of the coatings were evaluated by optical microscopy, XRD and EDS methods in both heat treatment (HT) and plasma treatment (PT) conditions. It was shown that coating thickness as well as its XRD spectrum (i.e. intensity and breadth of peaks) was different. These disparities were related to sputtering phenomenon, special transformation behaviour, and residual strain in the plasma treated electroless Ni-P coatings. It was also found that chemical composition of the coatings could be altered during plasma process.

Keywords: Ni-P coating, Plasma treatment, Phase transformation, Sputtering, Diffraction intensity

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/	/	/	1	/	/	1	1
/	/	/	/	/	/	1	1

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