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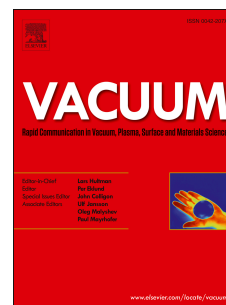
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Tribological and corrosion properties of PM 316L matrix composites reinforced by in situ polymer-derived ceramics

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Abstract:

In this study, the 316L stainless steel metal matrix composites with different weight percentages (1.5-7 wt.%) of polycarbosilane (PCS) were fabricated by means of solution-assisted wet mixing and spark plasma sintering (SPS). The effect of PCS content on the phase, microstructure, elements distribution, and microhardness was investigated in detail. The wear resistance of the composites was tested by using a ball-on-disk tribotester. The corrosion resistance of the composites was investigated utilizing potentiodynamic polarization. The results showed that the phase of the 316L without PCS consisted of austenite. New phases such as precipitated M_7C_3 and iron silicide were formed when the PCS was added. The volume fraction of the precipitated carbides and iron silicide was increased with the increase in the PCS content. The microhardness of the composites was increased with the increase in PCS. While, the best wear performance was attained with a PCS content of 3 wt.%. The corrosion resistance of the composites was decreased with the increase in the PCS

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