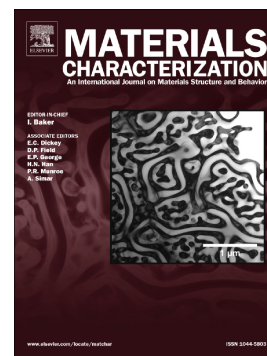


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# **Influence of bias voltage on structure and tribocorrosion properties of TiSiCN coating in artificial seawater**

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## **Abstract**

The TiSiCN coatings deposited at different bias voltages were fabricated on Ti6Al4V alloy by arc ion plating. The structure and properties of the TiSiCN coating were characterized using scanning electron microscope, X-ray diffraction, X-ray photoelectron spectroscopy, transmission electron microscopy, nanoindentation, potentiostat and ball-on-plate wear tests. As the bias voltage increases, the TiSiCN coating shows a nanocrystallite/amorphous structure, whereas the phase constitution and grain size changed slightly, and its hardness and tribocorrosion properties also change correspondingly. When the bias voltage is -100 V, the coating has a composite structure of typical nanocrystallite/amorphous, and a small amount of MAX phase of  $\text{Ti}_3\text{SiC}_2$ . Moreover, the protection potential applied on the coating effectively prevent the electrochemical corrosion of the coating. However, the applied protection potential will accelerate the degradation of the coating when the channel formed between the surface of the wear track and substrate.

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