Fabrication and characterization of HfC/TiC multilayer coating by vacuum plasma spraying

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The hafnium carbide and titanium carbide(HfC/TiC) multilayer coating on carbon/carbon (C/C) composites was successfully fabricated by vacuum plasma spray (VPS) system. The technique of vacuum plasma spraying is capable of quickly depositing dense and thick layers on a substrate. The substrate was C/C composite with a silicon carbide (SiC) layer fabricated by chemical vapor reaction (CVR). HfC powder of 20 ㎛ and TiC powder of 20 ㎛m were selected for vacuum plasma spraying. The HfC/TiC multilayer was evaluated through the analysis of scanning electron microscope (SEM) equipped with energy dispersive spectroscopy (EDS). And the adhesion between coating layer and substrate was measured using a universal testing machine (UTM).