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(57) Abstract :

An electrically conductive material composition contains a base layer X and a top layer Y. The X constitutes copper graded material and Y constitutes carbon-based nanomaterial. These layers are deposited onto the metallic bipolar plates via a thermal spray deposition route. The metallic bipolar plates are utilized in PEM fuel cells and the coat materials are applied to but not confined to the above stated materials or application. The layers can be a pure or composite with high electrical conductivity. The top layer Y disclosed in the present invention is a pure graphene sheets, rapidly synthesized in the plasma plume of thermal spraying process.

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