

High Anatase Rate Titanium Dioxide Coating Deposition by Low Power Microwave Plasma Spray

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ABSTRACT

Titanium dioxide is a promising photocatalyst material because of the magnificent properties of this material where it is able to remove the air pollution substance and the deodorizing function. Generally, the deposition method of a titanium dioxide coating is carried out by an organic system binder but the powerful photocatalytic reaction will degrade the binder. Therefore, thermal spray is considered to be the alternative method but this method will induce crystallization transformation of titanium dioxide from anatase phase with high photocatalytic activity to rutile phase with low photocatalytic activity which is caused by high heat input. Since our microwave plasma spraying device is operable at low power comparing with conventional high power plasma spray, the reduce effect of the heat input onto the particles at the time of spraying can be achieved and coating deposition with high rate of anatase phase is expected. Therefore, in this research, the coating deposition by controlling the heat input into the spray particle which can be resulted in high rate of anatase phase with high photocatalytic activity was conducted. By controlled condition, coating with optimum anatase rate of 83% is able to be fabricated by this method.

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