Titanium dioxide coatings were deposited by utilizing atmospheric plasma spraying (APS) system. The agglomerated TiO$_2$ nano-powder and different spray parameters like argon flow rate were used to determine their influences on the crystalline structure and photo-catalytic performance of the coatings. The structure and crystallite size of as-sprayed TiO$_2$ coatings were characterized by X-ray diffraction (XRD) and Transmission electron microscopy (TEM). Photo-catalytic efficiency of the elaborated samples was also determined in an environmental test chamber set-up and evaluated from the conversion rate of ethanol. The as-sprayed TiO$_2$ coating was photo-catalytically reactive for the degradation of ethanol. The photo-catalytic activity was influenced by spray conditions. It is found that the photo-catalytic activity is significantly influenced by anatase content. The results showed that the argon flow rate has an influence on anatase content and photo-catalytic activity of the TiO$_2$ coatings.

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