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Analysis of Corrosion Protection Behavior of Al₂O₃-TiO₂ Oxide Ceramic Coating on Carbon Steel Pipes for Petroleum Industry

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Abstract

Corrosion is the deterioration of materials by chemical interaction with their environment. In the oil and gas industry, corrosion of the pipelines and other equipment is one of the leading causes of failure and the corrosion-related costs are very high. Hence, corrosion protection is an essential requirement. In this study, the objective is to analysis of the corrosion protection behavior of spray Alumina-Titania (Al₂O₃-TiO₂) oxide ceramic coating on carbon steel pipes C45 using two different thermal spray coatings processes. These two different thermal spraying coating, High velocity oxy-fuel (HVOF) and plasma thermal spraying techniques can be used instead of extensive treatment by expensive chemical formation of coatings on pipelines and equipment to improve or restore a component's surface properties or dimensions and to protect them from corrosion. Molten or semi-molten ceramic composite powders are sprayed on the surface in order to produce

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