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Characterization of plasma sprayed CNT reinforced alumina coatings on ASME-SA213-T91 boiler tube steel

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Erosion-corrosion in boiler steels is both costly and dangerous. Many times hot corrosion and erosion are the main causes for shutdown of power plants. Apart from shut down in power plants, it limits steam temperature, reduces thermal efficiency of boilers and loss of billions of dollars for the replacement of corroded structures, machinery and equipment. In this research work, alumina coatings reinforced with various percentages of carbon nano tubes (CNTs) were prepared and has been successfully deposited on ASME-SA213-T91 boiler tube steel with purpose to enhance the corrosion resistance. Plasma spray process methodology was used to deposit these coatings. Ni-20Cr was used as bond coat before applying CNTs- Al_2O_3 coatings. The coatings were subjected to metallography, XRD, SEM/EDAX and X-ray mapping analysis. A decrease in the porosity has been observed with increase in CNTs content. The carbon nano tubes were found to be uniformly distributed within the Al_2O_3 matrix. The CNTs were chemically stable during the spray forming. These carbon nano tubes found to be stable even at high processing temperature and did not react to form oxides.

Biography

Buta Singh Sidhu is a notable Academician and Technologist and is Dean Academic of IKG Punjab Technical University Jalandhar (India). Additionally, he is currently holding a position of Dean International Collaborations. He has completed his PhD from Indian Institute of Technology, Roorkee, India. Apart from member of many of the national and international bodies, he has nominated as member of the TSS Thermal Spray Advisory Council of TSS-ASM Thermal Spray Society, an affiliate Society of ASM International, USA. He has published 140 research papers in reputed journals and conference proceedings and is serving as an Editorial Board Member of various journals/conferences of repute. He is also Editor-in-Chief of International Journal of Surface Engineering and Materials Technology.

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