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## Effect of particle size qualitative behaviour of SiC-based refractory paints for super alloy nickel-based substrates

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High-temperature resistant coatings represent an important potential research due to their applications in (turbines, engines, aeronautic, etc). Ceramic coatings are effective, economic method of protecting metals and ceramic compounds in severe environments. Refractory paints based on silicon carbide (SiC) along with alkali inorganic binders were investigated by applying different mixtures of  $\beta$ -SiC. The alkali activator used in this work was an aqueous solution of NaOH/Na<sub>2</sub>SiO<sub>3</sub>, Matakaolin was used as a raw material of alumina silicate. 5 samples with different proportions of  $\beta$ -SiC particle sizes were prepared to form the Bimodal  $\beta$ -SiC. The samples were 100% micron, 70% micron, 30% nano, 50% micron, 0% nano, 30% micron, 70% nano and 100% nano. The samples were applied on super alloy Nickel-based (Inconel 738) then cured at 80°C for 24 hours. Following that, the thermal treatment, analyses have been done. Analyses like adhesion test and pin on disk tests were also performed. The results of the adhesion test showed maximum grade of adhesion for all samples. To study the corrosion behavior, Salt Spray test was done; the results of this test revealed high corrosion resistance for all samples after 500 hours of exposure. In general, by increasing the Nano-  $\beta$ -SiC portion of the samples, better corrosion and abrasion resistance resulted.

### Biography

Ayda Khosravanihaghighi has completed her MSc in Material Science and Engineering from Shiraz University and Bachelor degree in Chemical Engineering from Azad University School of Engineering. She is assisting different related studies in laboratory of university. She is interested in research studies and published some papers in reputed journals and also received the best oral presenter in 2013 at the 3<sup>rd</sup> International Conference on Advanced Materials Research. She is a member of Nano Society of Iran.

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