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TiC-X nanocomposite coating in-situ by laser cladding process without powder nozzle

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Today's technology requires creating high-value improvement and treatment, not from cost reduction alone, but from high levels of skills in maximum integrity, quick production with less waste, density, surface quality and short time. This study contains cladding two steps process on TiC-X nanocomposites coating *in-situ* by laser on the substrate in a controlled manner without using the powder nozzle. The following are listed some of the advantages for this manner such as fully fused coating to the substrate with little/no porosity, minimal heat input results in narrow heat affected zone, minimal heat input also results in limited distortion of the substrate and reduces the need for additional corrective machining and easy, fast and green peace to automate production. A homogenous combination of a polymer as chemical adhesive, and the Ti, C and X powder particles causes sufficient adhesion of the powders mixed on the substrate while inert gas flows upon the substrate surface during the laser cladding process using an easy setup. Consequently, necessity of using powder nozzle can be eliminated without worrying. Using the inert gas is well able to prevent oxidation of the TiC-X nanocomposite coating at high temperatures. This approach can identify the reliable uniform and high quality nano-compositions coating during reinforcing TiC nanosized particles with *in-situ* formed X matrix. So, the hardness optimization of the group of nanocomposites with minimum fluctuation of distributions while wear rate ratio of the TiC reinforced X-based matrix nanocomposite to the substrate very less than one is sufficiently achieved.

Biography

Mansoureh Ganjali has completed his PhD from Academy of Sciences of Belarus, Institute of Physics. She is the as a Researcher and a Member of the Board of Directors of Nour Zoha Materials Engineering Research Institute (NMERI). She has published 12 papers in reputed journals, 27 presentations in national and international conferences around the world, more than 10 scientific and semi-industrial projects finished in Iran and Belarus and 3 Semi-industrial projects currently in Iran and United State of America.

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