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Laser surface modification of Ti alloys for biomedical applications

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Titanium is becoming one of the most promising engineering materials and the interest in the application of titanium alloys to mechanical and tribological components is growing rapidly in the biomedical field, due to their excellent properties. However, their inertness and low biocompatibility are the most serious drawbacks for biomedical applications. In addition, it is dangerous for Ti–6Al–4V to stay in the human body for a long time, because the element aluminum has strong neurotoxicity and vanadium is a strong cytotoxin. So, surface modification of titanium and its alloys is a promising work in enlarging their application scope. Laser beams are widely used in surface modification of different metals, owing to their high coherence, directionality and high energy density. Laser surface remelting, laser alloying and laser cladding have been studied to improve the surface properties of many kinds of metals. Laser cladding technique has been widely used to prepare many kinds of coatings because it can provide high production efficiency, a fine control of the deposition process and a mechanical interlock at the interface between the coating and the substrate. In light of this, the aim of the present work is to carry out an exploratory study of laser surface modification of Ti alloys by laser cladding.

Biography

Monireh Ganjali has completed his PhD in 2005 from National Academy of Science of Belarus, Institute of Physics. She is Assistant Professor of Laser, Biomaterials group, Nanotechnology and Advanced materials department, materials and energy research center. She has published more than 12 papers in reputed journals and more than 30 presentations in various conferences.

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