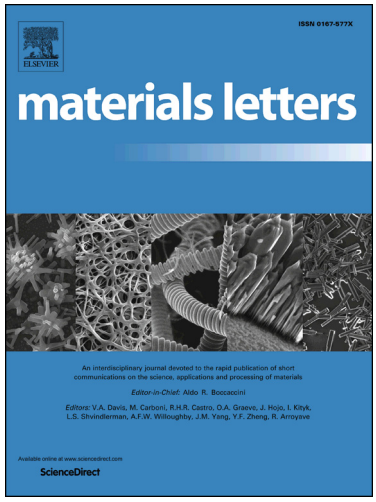

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Enhanced Mechanical Stability of PTFE Coating on Nano-Roughened NiTi for Biomedical Applications

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Abstract

Polytetrafluoroethylene (PTFE) inherently exhibits deficient bonding to other materials because of its low surface energy. In this study, large-scale nanopatterns were introduced to nickel–titanium (NiTi) to achieve strongly tightened PTFE coating layers on the metal substrate. The nano-roughened NiTi surface was produced using target-ion induced plasma sputtering. Typical porous PTFE coating layers were observed, and PTFE was partially infiltrated into nanoscale pores. The mechanical stability of the PTFE coating was consequently enhanced, indicating the great potential of this coating for medical devices including catheters, stents, and guide wires.

1. Introduction

Nickel–titanium (NiTi) alloy has been extensively used for biomedical devices such as

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