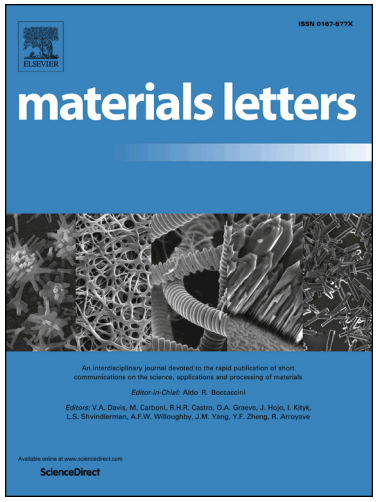

Fabrication of Self-healing Waterbased Superhydrophobic Coatings from POSS modified Silica Nanoparticles

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Fabrication of Self-healing Waterbased Superhydrophobic Coatings from POSS modified Silica Nanoparticles

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Abstract:

The preparation of waterborne superhydrophobic coatings with self-healing ability is reported. These coatings were environment-friendly water-based system and could be easily deposited on many different substrates. And most of all, it could repair the damaged surfaces and recover its superhydrophobicity and self-cleaning ability via heating even after O_2-plasma etching or immersing with amphiphiles aqueous solution. This simple and practical method provides a new approach to make durable superhydrophobic materials in the spirit of green.

Keywords: Nanoparticles; Waterborne; Superhydrophobicity; Surfaces; Self-healing

1. Introduction

Due to self-cleaning ability and water repellency, superhydrophobic coatings can be used in many important potential applications [1–5]. Currently, special attention has been focused on their mechanical durability, especially in the outdoor [6–10]. From a practical standpoint, endowing a superhydrophobic coating with the self-repairing ability may be the best strategy to realize the long service of superhydrophobic coatings [11–16]. Some works about self-healing superhydrophobic coatings have been developed lately. Sun group prepared spray-coated self-repairing superhydrophobic coatings. Once the top layers of coatings were scratched or destroyed, the stored healing agents fluoroalkyl silane in the inner of coating could migrate onto the