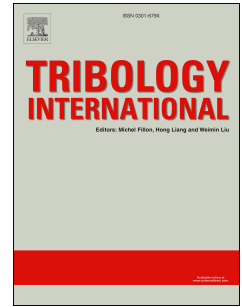


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Effect of annealing induced crystalline evolution on the scratch resistance of polylactide

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Abstract

The scratch performance of semi-crystalline polymers is highly dependent on the crystalline morphology. To study the effect of thermal annealing on the scratch behavior of Polylactide (PLA), a series of scratch tests were conducted on multilayer assembled PLAs, which had been annealed for different time. It was found that greatly delayed critical damage including groove formation and ploughing was achieved, accompanied with obviously suppressed surface cracking and deformation following the increase of annealing time. The structural evolution during the annealing process was further investigated for better construction of structure-property relationship, which implied that the higher crystallinity and tensile strength originating from the perfection of crystalline morphology, played a significant role in restraining the surface deformation and cracking during the scratch process.

Key words: Scratch resistance; Thermal annealing; Crystal morphology; Shish-kebab

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1. Introduction

Polymeric materials have caught significant attention nowadays because of their

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