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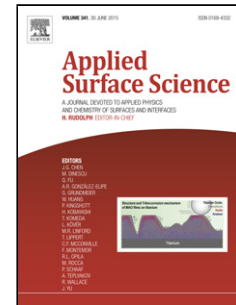
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# Effects of hierarchical structures and insulating liquid media on adhesion

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## Highlights

- An adhesive contact model is built based on Lifshitz-Hamaker approach.
- Effects of hierarchical structures and media on adhesion are studied.
- Hierarchical structures and media effectively decrease the adhesive interaction.
- Optimal sizes of hierarchical structures for small adhesion are given.
- Hierarchical structures have a greater influence on adhesion than media.

## Abstract

Effects of hierarchical structures and insulating liquid media on adhesion are investigated through a numerical adhesive contact model established in this paper, in which hierarchical structures are considered by introducing the height distribution into the surface gap equation, and media are taken into account through the Hamaker constant in Lifshitz-Hamaker approach. Computational methods such as inexact Newton method, bi-conjugate stabilized (Bi-CGSTAB) method and fast Fourier

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