Biomimetics In Materials Science

DOWNLOAD HERE

From the contents: Ch 1: Introduction (Definitions, scope of the book, history of the research area).-PART I: SELF-HEALING MATERIALS.- Ch 2: The concept of self-healing in materials science: Self-healing in polymers: ionomers, fiber-reinforces composites.- Self-healing ceramics.- Self-healing concrete.- Self-healing in metal composites.- Self-healing coatings.- Ch 3: Thermodynamics of self-healing: Thermal and configurational entropy.- Multiscale structure and self-organization.- From thermodynamics of degradation to self-organization. Degradation and healing parameters. Multi-parameter description and computational schemes.- Ch 4: Metal-matrix alloys reinforced with shape-memory alloys: Mg-Based Solution-Treated Matrix Alloy.- Sn-based Matrix Alloy.- Ch 5: Low-melting alloy infiltrated into high-melting matrix: CFD modeling.- Experimental studies.- Ch 6: Damage prevention in metals: Self healing Al alloys.- Other approaches.- Ch 7: Other approaches to self-healing in metals.- Vascular systems.- Incorporating O-sensitive healing agent.- Incorporation bacteria.- Incorporating Nanotubes.- PART II: SELF-LUBRICATING COMPOSITE MATERIALS.- Ch 8: Tribological properties of composites at the macro, micro-, and nanoscale: Dry friction: mechanisms, modeling, and scale effects.- Wear mechanism and models.- Lubrication and lubricants: from macro to nano.- Ch 9: Self-lubrication as a special case of self-healing: Surface texturing for self-lubrication.-Embedding lubricant capsules for self-lubrication.- Ch 10: Surface self-organization and wear reduction: Thermodynamics of surface self-organization during sliding.- Wear and friction reduction due to the formation of tribolayers of Cu (Garkunov and Bershadsky s effects).- Wear reduction in metal-matrix composite.- Ti and Al composites.- PART III: SELF-CLEANING MATERIALS.- Ch 11: Lotus effect: self-cleaning and superhydrophobicity: Experimental data on superhydrophobic plant leaves.-Surface structure of hydrophobic plant leaves.- Self-cleaning.- Ch 12: Effect of surface roughness on wetting and adhesion: Contact angle and surface energy.- Homogeneous and composite interface.-Wenzel and Cassie models.- Hysteresis of the contact-angle and adhesion.- Measures of wetting, adhesion and superhydrophobicty.- Ch 13: Self-cleaning surfaces utilizing the lotus effect: Paints.-Textiles.- Optical applications.- Coatings.- Combining self-cleaning with self-healing.- Ch 14:

Oleophobicity and omniphobicity: Wetting of solids by organic liquids.- Designing a universal ultraphobic surface.- Experimental results and applications.- Ch 15: Underwater self-cleaning: Underwater oleophobicity and self-cleaning.- Shark-skin and other biomimetic effects.- Ch 16: Conclusion.- EAN/ISBN : 9781461409267 Publisher(s): Springer, Berlin, Springer US Format: ePub/PDF Author(s): Nosonovsky, Michael - Rohatgi, Pradeep K.

DOWNLOAD HERE

Similar manuals:

Biomimetics In Materials Science