

Contents

Preface.....	ix
Editors.....	xi
Contributors.....	xiii

PART I General

Chapter 1 Introduction to Surfactants.....	3
<i>Michael L. Free</i>	

PART II Tribological Aspects in Micro- and Nanodevices

Chapter 2 Geometry and Chemical Effects on Friction and Adhesion under Negligible Loads.....	13
<i>Yasuhisa Ando</i>	
Chapter 3 Effect of Harsh Environment on Surfactant-Coated MEMS.....	51
<i>Joelle Frechette, Roya Maboudian, and Carlo Carraro</i>	
Chapter 4 Surfactants in Magnetic Recording Tribology.....	59
<i>T. E. Karis and D. Pocker</i>	

PART III Self-Assembled Monolayers and Ultrathin Films: Relevance to Tribological Behavior

Chapter 5 Frictional Properties of Organosilane Monolayers and High-Density Polymer Brushes.....	89
<i>Motoyasu Kobayashi, Hideomi Ishida, Masataka Kaido, Atsushi Suzuki, and Atsushi Takahara</i>	

- Chapter 6** Tribology of Ultrathin Self-Assembled Films on Si: The Role of PFPE as a Top Mobile Layer..... 111
N. Satyanarayana, S. K. Sinha, and M. P. Srinivasan
- Chapter 7** Surface Forces, Surface Energy, and Adhesion of SAMs and Superhydrophobic Films: Relevance to Tribological Phenomena.... 133
Ya-Pu Zhao, Li-Ya Guo, Jun Yin, and Wei Dai
- Chapter 8** Molecular Understanding of Nanofriction of Self-Assembled Monolayers on Silicon Using AFM..... 173
Sharadha Sambasivan, Shuchen Hsieh, Daniel A. Fischer, and Stephen M. Hsu
- Chapter 9** Mechanism of Friction Reduction by MoDTC/ZDDP Tribofilms and Associated Nanometer-Scale Controlling Factors..... 189
Jiping Ye
- Chapter 10** Synthesis, Characterization, and Tribological Properties of Sodium Stearate-Coated Copper Nanoparticles 213
Lei Sun, Zhishen Wu, and Zhijun Zhang

PART IV Polymeric and Bio-Based Surfactants

- Chapter 11** Surface Friction and Lubrication of Polymer Gels 223
Miao Du and Jian Ping Gong
- Chapter 12** Friction of Elastomers against Hydrophobic and Hydrophilic Surfaces 247
Sophie Bistac
- Chapter 13** Tribological Properties of Ag-Based Amphiphiles..... 259
Girma Biresaw
- Chapter 14** Vegetable Oil Fatty Acid Composition and Carbonization Tendency on Steel Surfaces at Elevated Temperature: Morphology of Carbon Deposits..... 291
Ömer Gül and Leslie R. Rudnick

- Chapter 15** Biobased Greases: Soap Structure and Composition Effects on Tribological Properties 309
Brajendra K. Sharma, Kenneth M. Doll, and Sevim Z. Erhan

PART V Surfactant Adsorption and Aggregation: Relevance to Tribological Phenomena

- Chapter 16** How to Design a Surfactant System for Lubrication..... 327
Bengt Kronberg

- Chapter 17** Aqueous Solutions of Oxyethylated Fatty Alcohols as Model Lubricating Substances 341
Marian Wlodzimierz Sulek

- Chapter 18** Aqueous Solutions of Mixtures of Nonionic Surfactants as Environment-Friendly Lubricants 371
Tomasz Wasilewski

- Chapter 19** Surfactant Adsorption and Aggregation Kinetics: Relevance to Tribological Phenomena..... 407
Rico F. Tabor, Julian Eastoe, and Peter J. Dowding

- Chapter 20** Effect of Surfactant and Polymer Nanostructures on Frictional Properties 431
P. Somasundaran and Parag Purohit

- Chapter 21** An Extended-Drain Engine Oil Study 437
Joseph M. Perez

- Index**..... 449