

Contents

Part I Basic Mechanisms

Studies of the Atom-Surface Interaction and Charge Exchange in Sputtering. By N.D. Lang (With 4 Figures)	2
Mechanisms for Excited Neutral and Negative and Positive Ion Desorption from Surfaces. By D.E. Ramaker (With 7 Figures)	10
Electronic Dynamics of Complex DIET Excitations By D.R. Jennison, E.B. Stechel, and J.A. Kelber (With 2 Figures)	24
Time Dependent Theory of Electronic Structure and Nuclear Dynamics in DIET. By E.B. Stechel (With 1 Figure)	32
Scattering Approach to Two-Hole Final States By J. Rubio, J.M. López Sancho, M.C. Refolio, and M.P. López Sancho (With 2 Figures)	40
Microscopic Calculation of Retunneling Rates of Hydrogen on Transition Metals. By W. Hübner, W. Brenig, and H. Kasai (With 3 Figures)	44

Part II Ion Desorption via Core Excitations

Fragmentation of CO and Transition Metal Carbonyls Following Soft X-Ray Excitation. By W. Eberhardt, C.T. Chen, W.K. Ford, E.W. Plummer, and H.R. Moser (With 11 Figures)	50
Polarization Dependent Resonances in Core Initiated Photon Stimulated Desorption of Ions from Chemisorbed Molecules. By R. Treichler, W. Riedl, W. Wurth, P. Feulner, and D. Menzel (With 6 Figures)	68
The Measurement of Auger Electron-Ion Coincidence Events from Surfaces By M.L. Knotek and J.W. Rabalais (With 3 Figures)	77
3p-Core Hole State Sensitivity in Ion Desorption from Oxidized Cr By E. Bertel, R. Stockbauer, R.L. Kurtz, T.E. Madey, and D.E. Ramaker (With 2 Figures)	84
Site Specificity in Stimulated Desorption from TiO ₂ By R.L. Kurtz, R. Stockbauer, and T.E. Madey (With 2 Figures)	89

Resonant Photoemission and PSD of Rare Earth Oxides By J. Schmidt-May, F. Senf, J. Voss, C. Kunz, A. Flodström, R. Nyholm, and R. Stockbauer (With 4 Figures)	94
ESD from NO and NO ₂ on Pt(100): Importance of Core-Level Assisted Ion Desorption and Application to the Investigation of NO ₂ Decomposition By U. Schwalke, H. Niehus, and G. Comsa (With 3 Figures)	98

Part III Angular and Energy Distributions of Ions

Recent Advances Using ESDIAD: Applications to Surface Chemistry By T.E. Madey, C. Benndorf, N.D. Shinn, Z. Misković, and J. Vukanić (With 6 Figures)	104
Internal and Translational Energies of Molecules Desorbed by Electronic Transitions. By K. Snowden (With 6 Figures)	116
ESDIAD Studies of the Structure of Species Chemisorbed on Ni(110). The Surface Bonding of NH ₃ , NH ₂ , and CO. By J.T. Yates, Jr., C. Klauber, M.D. Alvey, H.M. Metiu, J. Lee, R. Martin, J. Arias, and C. Hanrahan (With 8 Figures)	123
Stimulated-Desorption of Hydrogen from Water on Transition Metal Surfaces. By R.H. Stulen (With 5 Figures)	130
ESDIAD from Adsorbates on Metal Surfaces: Directions and Widths for CO on Ru(001) and Ni(110). By W. Riedl and D. Menzel (With 3 Figures) ...	136

Part IV Desorption of Neutrals

ESD Neutrals from Chemisorbed and Physisorbed Species: Angular and Energy Distributions. By P. Feulner (With 9 Figures)	142
Electronically Induced Desorption of Neutral Atoms Observed by Optical Techniques. By N.H. Tolk, R.F. Haglund, Jr., M.H. Mendenhall, E. Taglauer, and N.G. Stoffel (With 5 Figures)	152
Electron Stimulated Desorption of Neutrals from Alkali Halide Surfaces By M. Szymoński, J. Rutkowski, A. Poradzisz, Z. Postawa, and B. Jorgensen (With 9 Figures)	160

Part V Desorption from Condensed Material

The Erosion of Condensed Gases by keV Electron Bombardment By J. Schou, O. Ellegaard, P. Børjesen, and H. Sørensen (With 3 Figures) 170	170
Desorption Induced by Electronic Transitions in Rare Gas Clusters By H. Haberland (With 1 Figure)	177
Electron and Photon Stimulated Desorption from Organic Molecular Solids: Final State Leading to Desorption. By J.A. Kelber and M.L. Knotek (With 4 Figures)	182

Part VI Electronic Effects in Ion Impact

Inelastic Effects in Sputtering of Frozen Gases by keV Ions By R. Pedrys, D.J. Oostra, and A.E. de Vries (With 8 Figures)	190
Electronically Induced Desorption and Luminescence from Multilayer Argon Films. By W.L. Brown, C.T. Reimann, and R.E. Johnson (With 5 Figures)	199
Electronic Excitations and the Formation of Secondary Ions By Z. Sroubek, J. Zavadil, and K. Zdánský (With 2 Figures)	207
Ion Track Aspects of Fast Ion Induced Desorption of Biomolecules By G. Säwe, A. Hedin, P. Hakansson, and B. Sundqvist (With 4 Figures)	213

Part VII Laser Induced Processes

Photodesorption via Laser-Adsorbate Coupling By H.J. Kreuzer (With 3 Figures)	222
Non-Linear Laser Fluence Dependence in Desorption Induced by Resonant Multiphoton Excitation of an Adsorbate Vibration. By J. Heidberg (With 2 Figures)	230
Non-Thermal Laser-Induced Desorption of Compound Semiconductors By T. Nakayama and N. Itoh (With 4 Figures)	237
Photon-Induced Field Desorption Experiments with Laser and Synchrotron Radiation. By W. Drachsel, U. Weigmann, S. Jaenicke, and J.H. Block (With 6 Figures)	245

Part VIII Applications and Related Processes

Surface Physics Studies Using Spin-Polarized Nuclei By D. Fick, R.F. Haglund, Jr., and N.H. Tolk (With 6 Figures)	252
Work Function Dependence of the Li(2p) Excitation in Slow Collisions of Ground State Li Atoms with Tungsten Surfaces. By J. Hermann, J. Gehring, H. Schall, and V. Kempter (With 3 Figures)	266
Comparison of Fission Fragment, Pulsed Laser, and Electric Pulse Induced Molecular Desorption. By F.R. Krueger	271
Stimulated Desorption as a Potential Damage Mechanism in Ultraviolet Laser Optical Components. R. Haglund and N. Tolk (With 3 Figures)	277
Time Correlation of Ion and Electron Emission from Surfaces Following Fracture. By J.T. Dickinson, M.J. Dresser, and L.C. Jensen (With 9 Figures)	281
Index of Contributors	291