

CONTENTS

Preface	v
Conference organization	vi
<i>FUNDAMENTAL ASPECTS</i>	
Formation of icosahedral Al-Mn and Al-Ru by solid state processes D. M. Follstaedt and J. A. Knapp (Albuquerque, NM, U.S.A.)	1
Measurements of sputtering yield at the critical angle of incidence H. Hasuyama, Y. Kanda, K. Niiya and M. Kimura (Fukuoka, Japan)	9
Ion beam mixing of hydrogenated multilayer Fe-Ti and Ni-Ti films J. P. Hirvonen, M. A. Elve, J. W. Mayer and H. H. Johnson (Ithaca, NY, U.S.A.)	13
<i>SURFACE MORPHOLOGY</i>	
Sputtering-induced surface topography on F.C.C. metals. G. Carter, I. V. Katardjiev, M. J. Nobes (Salford, U.K.) and J. L. Whitton (Kingston, Ontario, Canada)	21
Ion-beam-induced morphological evolution of cone-shaped thin wires H. Hasuyama, K. Kanda, T. Soeda, K. Niiya and M. Kimura (Fukuoka, Japan)	33
Surface roughening during elevated temperature implantation of nickel. M. Ahmed, K. Ruffing and D. I. Potter (Storrs, CT, U.S.A.)	37
Scanning electron microscopy observation of high energy α -bombarded molybdenum surfaces. S. V. Naidu and P. Sen (Calcutta, India)	45
Surface texture induced by heavy ion bombardment: ion reflection analysis. J. Budzioch and W. Soszka (Krakow, Poland)	51
<i>AMORPHIZATION</i>	
Ion-beam-induced amorphization P. M. Ossi (Milan, Italy)	55
Amorphization of intermetallic compounds by ion bombardment. D. F. Pedraza (Oak Ridge, TN, U.S.A.)	69
Amorphous phase formation in aluminum-ion-implanted refractory metals. M. Saqib and D. I. Potter (Storrs, CT, U.S.A.)	81
Structural changes in a cobalt-based alloy after high fluence ion implantation S. A. Dillich and R. R. Biederman (Worcester, MA, U.S.A.)	91
<i>CHARACTERIZATION</i>	
Nitrogen implantation into steels N. Moncoffre (Villeurbanne, France)	99
Migration studies of nitrogen-implanted-iron by improved depth profiling F. Bodart, G. Terwagne and M. Piette (Namur, Belgium)	111
Quantitative analysis of boron in steel by secondary ion mass spectrometry using ion-implanted iron as standard S. Hashimoto, S. Doi, K. Takahashi, M. Terasaka (Kanagawa, Japan) and M. Iwaki (Saitama, Japan)	119
Compositional instabilities in aluminum-implanted nickel M. Ahmed and D. I. Potter (Storrs, CT, U.S.A.)	127
Compounds and microstructures of silicon-implanted nickel S. G. B. Fishman, M. Ahmed and D. I. Potter (Storrs, CT, U.S.A.)	135
Characterization of the aluminium surface layer implanted with nitrogen. S. Ohira (Shizuoka-ken, Japan) and M. Iwaki (Saitama-ken, Japan)	143
Effect of temperature on high fluence transition metal implants into polycrystalline aluminum F. H. Sanchez, F. Namavar, J. I. Budnick, A. Fasihuddin, C. H. Koch and H. C. Hayden (Storrs, CT, U.S.A.)	149
Study of a gold-implanted magnesium metastable system M. R. da Silva, A. A. Melo, J. C. Soares (Lisbon, Portugal), M. F. da Silva (Sacavém, Portugal) and R. Vianden (Bonn, F.R.G.)	161

Induced X-ray emission from neon implanted into metals	167
G. Deconninck and A. Lefebvre (Namur, Belgium)	
Characterization of ion-beam-synthesized boron nitride films.	173
A. Singh, R. A. Lessard and E. J. Knystautas (Quebec, Canada)	

OXIDATION

The influence of cerium, yttrium and lanthanum ion implantation on the oxidation behaviour of a 20Cr-25Ni-Nb stainless steel in carbon dioxide at 900-1050 °C	177
M. J. Bennett, H. E. Bishop, P. R. Chalker and A. T. Tuson (Didcot, U.K.)	
A Rutherford backscattering-channelling study of yttrium-implanted stainless steel before and after oxidation.	191
G. Dearnaley (Didcot, U.K.), T. Laursen and J. L. Whitton (Kingston, Ontario, Canada)	
Oxidation inhibition of iron by deposited and ion-implanted boron	197
F. Giacomozzi, L. Guzman, F. Marchetti, A. Molinari, M. Sarkar and A. Tomasi (Povo, Italy)	
Effects of tin ion and nitrogen ion implantation on the oxidation of titanium.	205
P. Madakson (Yorktown Heights, NY, U.S.A.)	

CORROSION

Aqueous corrosion behaviour of ion-implanted metals	213
H. Ferber and G. K. Wolf (Heidelberg, F.R.G.)	
Electrochemical properties of chromium-implanted Fe-Cr alloys	223
Y. Okabe, M. Iwaki and K. Takahashi (Saitama, Japan)	
Surface modification of electrodeposited chromium films by ion implantation	229
K. Terashima, T. Minegishi (Chiba, Japan), M. Iwaki (Saitama, Japan) and K. Kawashima (Tokyo, Japan)	
The influence of platinum implantation on the hydrogen embrittlement of tantalum	237
W. Ensinger and G. K. Wolf (Heidelberg, F.R.G.)	
Hydrogen permeation behavior in polycrystalline nickel implanted with helium, argon, nickel, yttrium and platinum	243
R. Nishimura, R. M. Latanision (Cambridge, MA, U.S.A.) and G. K. Hubler (Washington, DC, U.S.A.)	
Electrochemical studies of TiO ₂ films with various palladium implantation profiles	253
J. W. Schultze, L. Elfenhal, K. Leitner (Düsseldorf, F.R.G.) and O. Meyer (Karlsruhe, F.R.G.)	

WEAR

Tribological properties of ion-implanted steels	263
M. Iwaki (Saitama, Japan)	
Nitrogen implantation of steels: a treatment which can initiate sustained oxidative wear.	273
E. B. Hale, R. Reinbold and R. A. Kohser (Rolla, MO, U.S.A.)	
Enhanced endurance life of sputtered MoS _x films on steel by ion beam mixing	281
K. Kobs, H. Dimigen, H. Hübsch, H. J. Tolle (Hamburg, F.R.G.), R. Leutenecker (München, F.R.G.) and H. Ryssel (Erlangen, F.R.G.)	
Mechanical properties of nitrogen-implanted 18W-4Cr-1V bearing steel.	287
P. Madakson (Yorktown Heights, NY, U.S.A.)	
The improvement in the wear properties of GCr15-QBe2 wear pairs by ion implantation	291
Z. Jie, S. Yawen, L. Guanguan, L. F. Run, Y. Weiyi and L. Wang (Tianjin, China)	
The use of ion implantation to modify the tribological properties of Ti-6Al-4V alloy	297
S. Saritas (Gaziantep, Turkey), R. P. M. Procter (Manchester, U.K.) and W. A. Grant (Salford, U.K.)	
Friction and wear of ion-beam-modified ceramics for use in high temperature adiabatic engines	307
W. Wei, J. Lankford (San Antonio, TX, U.S.A.) and R. Kossowsky (University Park, PA, U.S.A.)	

MECHANICAL PROPERTIES

The effect of nitrogen and boron ion on cyclic deformation response in Ti-24V alloy	317
J. G. Han and R. F. Hochman (Atlanta, GA, U.S.A.)	

Structure and fatigue properties of ion-plated nickel films on steel	327
K. Thoma, R. Färber, Th. Wieder and H. Gärtner (Kassel, F.R.G.)	
Effects of titanium implantation on cavitation erosion of cobalt-based metal-carbide systems	333
N. V. H. Gately and S. A. Dillich (Worcester, MA, U.S.A.)	
Ductile-to-brittle transition induced by nitrogen ion implantation into WC single crystals	339
S. Bartolucci Luyckx, Y. Cassuto and J. P. F. Sellschop (Johannesburg, South Africa)	
Characterization of ion-beam-induced carbon deposition on WC-Co hard metal by microhardness, scratch and abrasive wear tests	343
J.-P. Hirvonen, J. Koskinen, A. Anttila (Helsinki, Finland), D. Stone and C. Paszkiet (Ithaca, NY, U.S.A.)	

NOVEL TECHNIQUES

Thick and homogeneous surface layers obtained by reactive ion-beam-enhanced deposition.	349
L. Guzman, F. Giacomozzi, B. Margesin, L. Calliari, L. Fedrizzi, P. M. Ossi (Povo, Italy) and M. Scotoni (Trento, Italy)	
Ion beam modification of TiN films during vapor deposition	357
R. A. Kant and B. D. Sartwell (Washington, DC, U.S.A.)	
A new rapid technique for characterizing microstructures of films produced by ion beams in the transmission electron microscope.	367
W. S. Sampath and P. J. Wilbur (Fort Collins, CO, U.S.A.)	

APPLICATIONS

Surface modification of industrial components by ion implantation	373
P. Sioshansi (Bedford, MA, U.S.A.)	
U.S. Navy Manufacturing Technology Program on ion implantation	385
F. A. Smidt, B. D. Sartwell (Washington, DC, U.S.A.) and S. N. Bunker (Bedford, MA, U.S.A.)	
Improving the wear resistance of metal-forming tools by ion implantation	399
Chr. Weist, G. K. Wolf (Stuttgart, F.R.G.) and P. Ballhause (Heidelberg, F.R.G.)	
Nitrogen implantation of type 303 stainless steel gears for improved wear and fatigue resistance.	407
F. M. Kustas, M. S. Misra and W. T. Tack (Denver, CO, U.S.A.)	
Ion beam smoothing of metallic mirrors.	417
D. C. Ingram, A. W. McCormick, P. P. Pronko (Dayton, OH, U.S.A.), J. A. Woollam, P. G. Snyder (Lincoln, NE, U.S.A.) and D. B. Poker (Oak Ridge, TN, U.S.A.)	
Ion sources and implantation systems	423
J. H. Keller (Hopewell Junction, NY, U.S.A.) and J. W. Robinson (University Park, PA, U.S.A.)	
AUTHOR INDEX	433
SUBJECT INDEX	434