

Volume 597

12 March 2014

ISSN 0921-5093

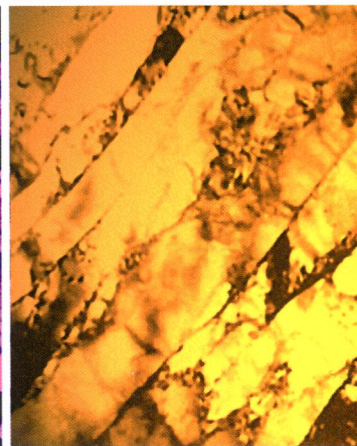
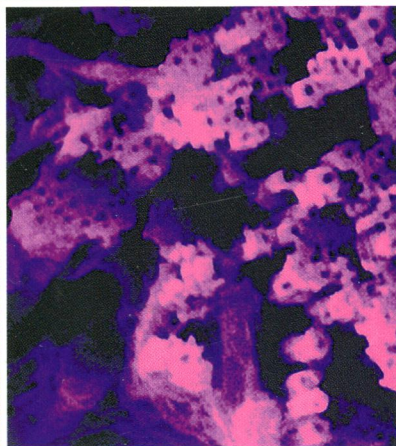
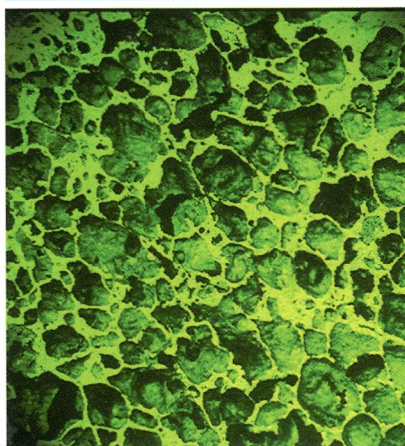
MATERIALS SCIENCE & ENGINEERING

Editor in Chief:
E.J. Lavernia

A

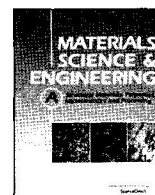
**Structural Materials: Properties,
Microstructure and Processing**

Editors:
N. Chawla
J.K. Shang
M.J. Starink
E.A. Werner
J.D. Whittenberger



Available online at www.sciencedirect.com

ScienceDirect



Contents

Research papers

Static and dynamic mechanical properties of alumina reinforced with sub-micron Ni particles N.L. Barham, W.D. Kaplan, D. Rittel (Israel)	1
The Bauschinger effect in drawn and annealed nanocomposite Cu–Nb wires G. Badinier, C.W. Sinclair (Canada), S. Allain, O. Bouaziz (France)	10
Effect of pre-oxidation of TiNi fibers on the interfacial and mechanical property of TiNi ₄ /Al composite J. Hu, Q. Zhang, G. Wu, Y. Liu, D. Li (China)	20
Hydrogen embrittlement susceptibility of a weld simulated X70 heat affected zone under H ₂ pressure A. Alvaro, V. Olden (Norway), A. Macadre (Japan), O.M. Akselsen (Norway)	29
Low temperature tensile deformation and acoustic emission signal characteristics of AISI 304LN stainless steel K. Barat, H.N. Bar, D. Mandal, H. Roy, S. Sivaprasad, S. Tarafder (India)	37
Effect of low-temperature phase transition on mechanical behavior of Fe–Cu alloys B. Minov, D. Terentyev, W. Van Renterghem (Belgium), Y. Osetsky (USA), M.J. Konstantinovic (Belgium)	46
Effects of Pb/Sn additions on the age-hardening behaviour of Mg–4Zn alloys S. Wei, T. Zhu, H. Hou (New Zealand), J. Kim, E. Kobayashi, T. Sato (Japan), M. Hodgson, W. Gao (New Zealand)	52
Characterization of Al–Li 2099 extrusions and the influence of fiber texture on the anisotropy of static mechanical properties A. Bois-Brochu, C. Blais, F.A.T. Goma, D. Larouche (Canada), J. Boselli (USA), M. Brochu (Canada)	62
A novel Ni ₂ AlTi-containing composite with excellent wear resistance and anomalous flexural strength H. Zhang, X.H. Wang, Z.J. Li, M.Y. Liu, Y.C. Zhou (China)	70
Densification and characterization of spark plasma sintered ZrC–ZrO ₂ composites I. Hussainova, N. Voltšihhin (Estonia), E. Cura, S.-P. Hannula (Finland)	75
Hot deformation behavior of hot-rolled AZ31 and AZ61 magnesium alloys M.L. Olguín-González, D. Hernández-Silva, M.A. García-Bernal, V.M. Sauce-Rangel (Mexico)	82
Capturing the stochastic mechanical behavior of micro and nanopillars A.A. Konstantinidis (Greece), K.E. Aifantis (Greece, USA), J.Th.M. De Hosson (The Netherlands)	89
Microstructure evolution of C/Mo double-coated SiC fiber reinforced Ti6Al4V composites X. Luo, X. Ji, Y. Yang, W. Zhang, S. Liu, Z. Xiao (PR China)	95
Assessment of homogeneity of the shear-strain pattern in Al–7 wt%Si casting alloy processed by high-pressure torsion C.M. Cepeda-Jiménez, A. Orozco-Caballero, J.M. García-Infanta (Spain), A.P. Zhilyaev (Russia), O.A. Ruano, F. Carreño (Spain)	102
A structure–property correlation study of neutron irradiation induced damage in EU batch of ODS Eurofer97 steel M. Kolluri (The Netherlands), P.D. Edmondson (UK), N.V. Luzginova, F.A.v.d. Berg (The Netherlands)	111
Effect of cathodic potential on hydrogen permeation of API grade steels in modified NS4 solution A.H.S. Bueno, E.D. Moreira, P. Siqueira, J.A.C.P. Gomes (Brazil)	117
Influence of cross-rolling on the mechanical properties of an accumulative roll bonded aluminum alloy AA6014 M. Ruppert, H.W. Höppel, M. Göken (Germany)	122
Fatigue mechanisms in an austenitic steel under cyclic loading: Experiments and atomistic simulations E.A. Soppa, C. Kohler, E. Roos (Germany)	128
Dynamic recrystallisation and precipitation behaviour of high strength and highly conducting Cu–Ag–Zr-alloys F. Bittner, S. Yin, A. Kauffmann, J. Freudenberger, H. Klauß, G. Korpala (Germany), R. Kawalla (Germany), W. Schillinger, L. Schultz (Germany)	139
Effect of normalizing temperature on the strength of 9Cr–3W–3Co martensitic heat resistant steel P. Yan, Z. Liu, H. Bao, Y. Weng, W. Liu (China)	148
Ductility enhancement through texture control and strength restoration through subsequent age-hardening in Mg–Zn–Zr alloys Y.H. Kim, H.T. Sohn, W.J. Kim (Republic of Korea)	157
Heat-to-heat variation of creep strength and long-term stability of microstructure in Grade 91 steels K. Sawada, H. Kushima, T. Hara, M. Tabuchi, K. Kimura (Japan)	164

Processing maps for hot working of 47Zr–45Ti–5Al–3V alloy Y.B. Tan, L.H. Yang, C. Tian, W.C. Liu, R.P. Liu, X.Y. Zhang (PR China)	171
Deformation mechanisms in austenitic TRIP/TWIP steels at room and elevated temperature investigated by acoustic emission and scanning electron microscopy M. Linderov (Russia), C. Segel, A. Weidner, H. Biermann (Germany), A. Vinogradov (Russia)	183
Enhancement in creep resistance of Ti–6Al–4V alloy due to boron addition G. Singh, D.V.V. Satyanarayana (India), R. Pederson (Sweden), R. Datta (India), U. Ramamurty (India, Saudi Arabia)	194
Effect of Cr addition on the alloying behavior, microstructure and mechanical properties of twinned CoFeNiAl _{0.5} Ti _{0.5} alloy Z. Fu, W. Chen, S. Fang, X. Li (China)	204
Effect of germanium and silicon additions on the mechanical properties of a near- α titanium alloy T. Kitashima, K.S. Suresh, Y. Yamabe-Mitarai (Japan)	212
Ti–6Al–4V welded joints via electron beam welding: Microstructure, fatigue properties, and fracture behavior X. Yang, S. Li, H. Qi (China)	225
Deformation mechanisms induced under high cycle fatigue tests in a metastable austenitic stainless steel J.J. Roa, G. Fargas, E. Jiménez-Piqué, A. Mateo (Spain)	232
Effects of rare earth elements addition on microstructures, tensile properties and fractography of A357 alloy W. Jiang, Z. Fan, Y. Dai, C. Li (PR China)	237
Load-biased martensitic transformation strain of Ti ₅₀ –Ni ₄₇ –Co ₃ strip obtained by a twin-roll casting technique L. Isola, P. La Roca, A. Roatta (Argentina), Ph. Vermaut, L. Jordan, P. Ochin (France), J. Malarría (Argentina)	245
Correlation between ferrite grain size, microstructure and tensile properties of 0.17 wt% carbon steel with traces of microalloying elements S. Nag, P. Sardar, A. Jain, A. Himanshu, D.K. Mondal (India)	253
Microstructure and strengthening mechanism of carbon nanotubes reinforced magnesium matrix composite C.D. Li, X.J. Wang, W.Q. Liu, K. Wu, H.L. Shi, C. Ding, X.S. Hu, M.Y. Zheng (PR China)	264
Acoustic emission study of fatigue crack propagation in extruded AZ31 magnesium alloy Z. Han, H. Luo, C. Sun, J. Li (China), M. Papaelias, C. Davis (United Kingdom)	270
A rate dependent constitutive model for ECAE Cu based on instrumented nanoindentation results J. Su (USA, People's Republic of China), W.G. Guo (People's Republic of China), L.J. Kecskes, S.N. Mathaudhu, Q. Wei (USA)	279
An <i>in situ</i> synchrotron X-ray diffraction study of precipitation kinetics in a severely deformed Cu–Ni–Si alloy H. Azzeddine, B. Mehdi (Algeria), L. Hennet, D. Thiaudière (France), B. Alili (Algeria), M. Kawasaki (South Korea, USA), D. Bradai (Algeria), T.G. Langdon (USA, UK)	288
Annealing twin development during recrystallization and grain growth in pure nickel Y. Jin (France), B. Lin (USA), M. Bernacki (France), G.S. Rohrer, A.D. Rollett (USA), N. Bozzolo (France)	295
Evaluation of fatigue and impact behavior of titanium carbide reinforced metal matrix composites V. Sivananth, S. Vijayarangan, N. Rajamanickam (India)	304
Texture and microstructure evolution and mechanical properties during friction stir welding of extruded aluminum billets J.-H. Cho, W. Jae Kim, C. Gil Lee (South Korea)	314
Computational homogenization of plastic porous media with two populations of voids Y.-K. Khdir, T. Kanit, F. Zaïri, M. Naït-Abdelaziz (France)	324
Molecular dynamics simulation of nanoindentation of Fe ₃ C and Fe ₄ C S. Goel (UK), S.S. Joshi (India), G. Abdelal (UK), A. Agrawal (USA)	331
Microstructure and fatigue performance of butt-welded joints in advanced high-strength steels G.K. Ahiale, Y.-J. Oh (Republic of Korea)	342
A comparative study between uniaxial compression and plane strain compression of Mg–3Al–1Zn alloy using experiments and simulations A. Chapuis, B. Wang, Q. Liu (China)	349
Composite structure modeling and mechanical behavior of particle reinforced metal matrix composites Y. Su, Q. Ouyang, W. Zhang, Z. Li, Q. Guo, G. Fan, D. Zhang (China)	359
The effect of atmosphere on the structure and properties of a selective laser melted Al–12Si alloy X.J. Wang (Australia, China), L.C. Zhang (Australia), M.H. Fang (China), T.B. Sercombe (Australia)	370
Experimental investigations of internal and effective stresses during fatigue loading of high-strength steel F. Vucko, C. Bosch, D. Delafosse (France)	381
Constitutive model of Ti17 titanium alloy with lamellar-type initial microstructure during hot deformation based on orthogonal analysis J. Liu, W. Zeng, Y. Lai, Z. Jia (China)	387
The effects of solidification on the microstructure and mechanical properties of modified ductile Ni-resist iron with a high manganese content M.M. Rashidi, M.H. Idris (Malaysia)	395

Cyclic deformation behavior of linear friction welded Ti6Al4V joints G.D. Wen (PR China, Canada), T.J. Ma, W.Y. Li, J.L. Li, H.Z. Guo (PR China), D.L. Chen (Canada)	408
Temperature and grain size dependent plastic instability and strain rate sensitivity of ultrafine grained austenitic Fe-14Cr-16Ni alloy C. Sun, J. Ma, Y. Yang, K.T. Hartwig, S.A. Maloy, H. Wang, X. Zhang (USA).	415
Order of influences on the ballistic resistance of armor ceramics and single crystals A. Krell, E. Strassburger (Germany).	422
Correlations between nanoindentation hardness and macroscopic mechanical properties in DP980 steels M.D. Taylor, K.S. Choi, X. Sun, D.K. Matlock, C.E. Packard (United States), L. Xu (China), F. Barlat (Republic of Korea)	431
<i>Rapid communications</i>	
Effects of Gd doping on Ni ₅₄ Mn ₂₅ Ga ₂₁ high-temperature shape memory alloy X. Zhang, J. Sui, X. Zheng, Z. Yang, W. Cai (China)	178
Effect of rare earth Ce on the fatigue life of SnAgCu solder joints in WLCSP device using FEM and experiments L. Zhang (China, USA), J.-g. Han, Y.-h. Guo, C.-w. He (China)	219
Slip-induced texture evolution of rolled Mg-6Al-3Sn alloy during uniaxial tension along rolling and transverse directions L. Zhang, C.-G. Liu, H.-Y. Wang, X.-L. Nan, G.-J. Liu, Q.-C. Jiang (PR China)	376
Author Index	441
Subject Index	444