B-J Lee

List of Publications by Year in Descending Order

261 papers	8,998 citations	49 h-index	83 g-index
272 ext. papers	10,682 ext. citations	4.2 avg, IF	6.56 L-index

#	Paper	IF	Citations
261	A thermodynamic description for the CoCrFeMnNi system. *Journal of Materials Science*, **2022**, 57, 1373-1389	4.3	1
260	Solute-Dislocation Binding and Solute Clustering as a Mechanism for Room Temperature Ductility and Formability of Mg Alloys. *Minerals, Metals and Materials Series*, **2022**, 93-96	0.3	
259	Effects of deformation-induced martensitic transformation on cryogenic fracture toughness for metastable Si8V2Fe45Cr10Mn5Co30 high-entropy alloy. *Acta Materialia*, **2022**, 225, 117568	8.4	4
258	Second nearest-neighbor modified embedded atom method interatomic potentials for Na-M-Sn (M = Cu, Mn, Ni) ternary systems. *Computational Materials Science*, **2022**, 206, 111305	3.2	
257	Interface characteristics and mechanical behavior of additively manufactured multi-material of stainless steel and Inconel. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2022**, 847, 143318	5.3	2
256	Diffusion in A15 Nb3Sn: An atomistic study. *Acta Materialia*, **2022**, 234, 118050	8.4	0
255	Ultrafast Na Transport into Crystalline Sn via Dislocation-Pipe Diffusion. *Small*, **2021**, e2104944	11	1
254	A comparative study on grain boundary segregation and solute clustering in Mg-Al-Zn and Mg-Zn-Ca alloys. *Journal of Alloys and Compounds*, **2021**, 894, 162539	5.7	3
253	Self-Assembly of Pulverized Nanoparticles: An Approach to Realize Large-Capacity, Long-Lasting, and Ultra-Fast-Chargeable Na-Ion Batteries. *Nano Letters*, **2021**, 21, 9044-9051	11.5	4
252	Activation of non-basal slip in multicomponent Mg alloys. *Journal of Magnesium and Alloys*, **2021**,	8.8	6
251	Second nearest-neighbor modified embedded-atom method interatomic potentials for the Mo-M (M = Al, Co, Cr, Fe, Ni, Ti) binary alloy systems. *Computational Materials Science*, **2021**, 194, 110473	3.2	2
250	Phase-field model with relaxation of the partition coefficient. *Computational Materials Science*, **2021**, 188, 110184	3.2	2
249	Second-nearest-neighbor modified embedded-atom method interatomic potential for V-M (M = Cu, Mo, Ti) binary systems. *Computational Materials Science*, **2021**, 188, 110177	3.2	4
248	Body-centered-cubic martensite and the role on room-temperature tensile properties in Si-added SiVCrMnFeCo high-entropy alloys. *Journal of Materials Science and Technology*, **2021**, 76, 222-230	9.1	7
247	Modified embedded-atom method interatomic potentials for Mg-Al-Ca and Mg-Al-Zn ternary systems. *Journal of Magnesium and Alloys*, **2021**, 9, 317-335	8.8	11
246	Effect of 1Al addition on deformation behavior of Mg. *Journal of Magnesium and Alloys*, **2021**, 9, 489-498	8.8	6
245	The Origin of Activation of Non-basal Slip in Mg-Ce Dilute Alloy: An Atomistic Simulation Study. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2021**, 52, 964-974	2.3	2

244	Effects of temperature and loading rate on phase stability and deformation mechanism in metastable V10Cr10Co30FexNi50-x high entropy alloys. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2021**, 804, 140766	5.3	1
243	Excellent strength-ductility combination of multi-layered sheets composed of high-strength V10Cr10Fe50Co30 high entropy alloy and 304 austenitic stainless steel. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2021**, 823, 141727	5.3	0
242	Strength□uctility enhancement in multi-layered sheet with high-entropy alloy and high-Mn twinning-induced plasticity steel. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2021**, 822, 141670	5.3	1
241	Computational design of V-CoCrFeMnNi high-entropy alloys: An atomistic simulation study. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2021**, 74, 102317	1.9	1
240	Deformation behavior of a Co-Cr-Fe-Ni-Mo medium-entropy alloy at extremely low temperatures. *Materials Today*, **2021**, 50, 55-55	21.8	10
239	2.3 GPa cryogenic strength through thermal-induced and deformation-induced body-centered cubic martensite in a novel ferrous medium entropy alloy. *Scripta Materialia*, **2021**, 204, 114157	5.6	4
238	Pressure dependence of thermodynamic interaction parameters for binary solid solution phases: An atomistic simulation study. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2021**, 75, 102342	1.9	1
237	Second nearest-neighbor modified embedded-atom method interatomic potentials for the Co-M (M = Ti, V) binary systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2020**, 70, 101791	1.9	5
236	Effects of Cr addition on Charpy impact energy in austenitic 0.45C-24Mn-(0,3,6)Cr steels. *Journal of Materials Science and Technology*, **2020**, 50, 21-30	9.1	8
235	Durability screening of Pt ternary alloy (111) surfaces for oxygen reduction reaction using Density Functional Theory. *Surfaces and Interfaces*, **2020**, 18, 100440	4.1	1
234	A new strategy for designing immiscible medium-entropy alloys with excellent tensile properties. *Acta Materialia*, **2020**, 193, 71-82	8.4	38
233	Second-nearest-neighbor modified embedded-atom method interatomic potential for Cu-M (M = Co, Mo) binary systems. *Computational Materials Science*, **2020**, 178, 109627	3.2	3
232	Effects of annealing temperature on microstructures and tensile properties of a single FCC phase CoCuMnNi high-entropy alloy. *Journal of Alloys and Compounds*, **2020**, 812, 152111	5.7	20
231	Evolution of microstructure and tensile properties of cold-drawn hyper-eutectoid steel wires during post-deformation annealing. *Journal of Materials Science and Technology*, **2020**, 41, 1-11	9.1	8
230	Effects of transformation-induced plasticity (TRIP) on tensile property improvement of Fe45Co30Cr10V10Ni5-xMnx high-entropy alloys. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2020**, 772, 138809	5.3	18
229	A thermodynamic description of the Al□Cu□Fe□Mn system for an immiscible medium-entropy alloy design. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2020**, 71, 101995	1.9	0
228	Second nearest-neighbor modified embedded atom method interatomic potentials for the Na unary and Na-Sn binary systems. *Computational Materials Science*, **2020**, 185, 109953	3.2	5
227	Interatomic potentials for Pt-C and Pd-C systems and a study of structure-adsorption relationship in large Pt/graphene system. *Computational Materials Science*, **2020**, 185, 109946	3.2	1

226	Precipitation-driven metastability engineering of carbon-doped CoCrFeNiMo medium-entropy alloys at cryogenic temperature. *Scripta Materialia*, **2020**, 188, 140-145	5.6	36
225	Effect of Plasma Ignition on the Growth Temperature Decrease of Single-Walled Carbon Nanotubes in a Plasma-Coupled Hybrid Chemical-Vapor-Deposition System. *Journal of the Korean Physical Society*, **2020**, 76, 1110-1115	0.6	0
224	Carbide Formation and Matrix Strengthening by Nb Addition in Austenitic Stainless Cast Steels Used for Turbo-Charger-Housing Materials. *Metals and Materials International*, **2020**, 26, 1506-1514	2.4	5
223	Development of strong and ductile metastable face-centered cubic single-phase high-entropy alloys. *Acta Materialia*, **2019**, 181, 318-330	8.4	67
222	Modified embedded-atom method interatomic potential for the Mg–Zn–Ca ternary system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2019**, 67, 101674	1.9	4
221	Effects of deformation-induced BCC martensitic transformation and twinning on impact toughness and dynamic tensile response in metastable VCrFeCoNi high-entropy alloy. *Journal of Alloys and Compounds*, **2019**, 785, 1056-1067	5.7	30
220	A thermodynamic description of the Co-Cr-Fe-Ni-V system for high-entropy alloy design. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2019**, 66, 101624	1.9	14
219	Excellent combination of cryogenic-temperature strength and ductility of high-entropy-alloy-cored multi-layered sheet. *Journal of Alloys and Compounds*, **2019**, 797, 465-470	5.7	12
218	Effects of strain rate on room- and cryogenic-temperature compressive properties in metastable V10Cr10Fe45Co35 high-entropy alloy. *Scientific Reports*, **2019**, 9, 6163	4.9	11
217	Replacement of Ni by Mn in Commercial High-Ni Austenitic Cast Steels Used for High-Performance Turbocharger Housings. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2019**, 50, 2585-2593	2.3	0
216	Novel Co-rich high performance twinning-induced plasticity (TWIP) and transformation-induced plasticity (TRIP) high-entropy alloys. *Scripta Materialia*, **2019**, 165, 39-43	5.6	108
215	Influence of initial microstructures on intercritical annealing behaviour in a medium Mn steel. *Materials Science and Technology*, **2019**, 35, 2092-2100	1.5	7
214	Cryogenic-temperature fracture toughness analysis of non-equi-atomic V10Cr10Fe45Co20Ni15 high-entropy alloy. *Journal of Alloys and Compounds*, **2019**, 809, 151864	5.7	32
213	Ultrastrong duplex high-entropy alloy with 2 GPa cryogenic strength enabled by an accelerated martensitic transformation. *Scripta Materialia*, **2019**, 171, 67-72	5.6	40
212	FCC to BCC transformation-induced plasticity based on thermodynamic phase stability in novel VCrFeCoNi medium-entropy alloys. *Scientific Reports*, **2019**, 9, 2948	4.9	38
211	Dislocation Behavior and Grain Boundary Segregation of Mg–Zn Alloys. *Minerals, Metals and Materials Series*, **2019**, 215-218	0.3	
210	Plastic Deformation Behavior of 40Fe–25Ni–15Cr–10Co–10V High-Entropy Alloy for Cryogenic Applications. *Metals and Materials International*, **2019**, 25, 277-284	2.4	37
209	Novel Co-rich high entropy alloys with superior tensile properties. *Materials Research Letters*, **2019**, 7, 82-88	7.4	80

208	Effects of V or Cu Addition on High-Temperature Tensile Properties of High-Ni-Containing Austenitic Cast Steels Used for High-Performance Turbo-Charger Housings. *Metals and Materials International*, **2019**, 25, 285-294	2.4	0
207	Authors□Reply to Discussion of □Effects of Cr Reduction on High-Temperature Strength of High-Ni Austenitic Cast Steels Used for High-Performance Turbochargers□*Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2019**, 50, 1098-1100	2.3	
206	Experimental investigation and phase diagram of CoCrMnNi□e system bridging high-entropy alloys and high-alloyed steels. *Journal of Alloys and Compounds*, **2019**, 785, 320-327	5.7	22
205	Effect of □precipitates on the microstructure and mechanical properties of non-equiatomic CoCrFeNiMo medium-entropy alloys. *Journal of Alloys and Compounds*, **2019**, 781, 75-83	5.7	49
204	Utilization of brittle □phase for strengthening and strain hardening in ductile VCrFeNi high-entropy alloy. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2019**, 743, 665-674	5.3	32
203	Effects of Zn on <c + a> slip and grain boundary segregation of Mg alloys. *Scripta Materialia*, **2019**, 160, 39-43	5.6	33
202	Modified embedded-atom method interatomic potentials for pure Zn and Mg-Zn binary system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2018**, 60, 200-207	1.9	16
201	Critical assessment of Pt surface energy □An atomistic study. *Surface Science*, **2018**, 670, 8-12	1.8	5
200	Understanding the physical metallurgy of the CoCrFeMnNi high-entropy alloy: an atomistic simulation study. *Npj Computational Materials*, **2018**, 4,	10.9	269
199	Dislocation binding as an origin for the improvement of room temperature ductility in Mg alloys. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing* , **2018**, 715, 266-275	5.3	26
198	Grain boundary engineering approach to improve hydrogen embrittlement resistance in Fe Mn C TWIP steel. *International Journal of Hydrogen Energy*, **2018**, 43, 10129-10140	6.7	23
197	Role of brittle sigma phase in cryogenic-temperature-strength improvement of non-equi-atomic Fe-rich VCrMnFeCoNi high entropy alloys. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2018**, 724, 403-410	5.3	33
196	Influence of hydrogen on the grain boundary crack propagation in bcc iron: A molecular dynamics simulation. *Computational Materials Science*, **2018**, 149, 424-434	3.2	14
195	Isothermal Treatment Effects on Precipitates and Tensile Properties of an HSLA Steel. *Metals and Materials International*, **2018**, 24, 525-531	2.4	2
194	Effects of homogenization temperature on cracking during cold-rolling of Al0.5CoCrFeMnNi high-entropy alloy. *Materials Chemistry and Physics*, **2018**, 210, 187-191	4.4	12
193	An interatomic potential for the Li-Co-O ternary system. *Computational Materials Science*, **2018**, 142, 47-58	3.2	9
192	A numerical model to predict mechanical properties of Ni-base disk superalloys. *International Journal of Plasticity*, **2018**, 110, 123-144	7.6	15
191	An approach for screening single phase high-entropy alloys using an in-house thermodynamic database. *Intermetallics*, **2018**, 101, 56-63	3.5	12

190	Microstructure and Mechanical Properties of High-Entropy Alloy CoCrFeMnNi Processed by High-Pressure Torsion at 77 K and 300 K. *Scientific Reports*, **2018**, 8, 11074	4.9	30
189	Second nearest-neighbor modified embedded-atom method interatomic potentials for the Pd-M (M = Al, Co, Cu, Fe, Mo, Ni, Ti) binary systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2018**, 62, 172-186	1.9	10
188	Role of atomic-scale chemical heterogeneities in improving the plasticity of Cu-Zr-Ag bulk amorphous alloys. *Acta Materialia*, **2018**, 157, 209-217	8.4	16
187	A Thermodynamic Modelling of the Stability of Sigma Phase in the Cr-Fe-Ni-V High-Entropy Alloy System. *Journal of Phase Equilibria and Diffusion*, **2018**, 39, 694-701	1	16
186	Effects of Cr Reduction on High-Temperature Strength of High-Ni Austenitic Cast Steels Used for High-Performance Turbo-chargers. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2018**, 49, 4604-4614	2.3	3
185	Improvement of tensile properties in (austenite+ferrite+□carbide) triplex hot-rolled lightweight steels. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2018**, 730, 177-186	5.3	9
184	Origin of radiation resistance in multi-principal element alloys. *Scientific Reports*, **2018**, 8, 16015	4.9	21
183	Exceptional phase-transformation strengthening of ferrous medium-entropy alloys at cryogenic temperatures. *Acta Materialia*, **2018**, 161, 388-399	8.4	100
182	Data to reproduce and modify "An approach for screening single phase high-entropy alloys using an in-house thermodynamic database". *Data in Brief*, **2018**, 20, 1337-1339	1.2	5
181	Modified embedded-atom method interatomic potentials for the Co-Cr, Co-Fe, Co-Mn, Cr-Mn and Mn-Ni binary systems. *Computational Materials Science*, **2017**, 130, 121-129	3.2	38
180	Interpretation of high-temperature tensile properties by thermodynamically calculated equilibrium phase diagrams of heat-resistant austenitic cast steels. *Metals and Materials International*, **2017**, 23, 43-53	2.4	4
179	Deformation-induced phase transformation of Co 20 Cr 26 Fe 20 Mn 20 Ni 14 high-entropy alloy during high-pressure torsion at 77 K. *Materials Letters*, **2017**, 202, 86-88	3.3	40
178	Effects of C and Si on strain aging of strain-based API X60 pipeline steels. *Metals and Materials International*, **2017**, 23, 450-458	2.4	8
177	Replacement of Ni by Mn in High-Ni-Containing Austenitic Cast Steels used for Turbo-Charger Application. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2017**, 48, 568-574	2.3	4
176	The phase stability of equiatomic CoCrFeMnNi high-entropy alloy: Comparison between experiment and calculation results. *Journal of Alloys and Compounds*, **2017**, 719, 189-193	5.7	62
175	Cryogenic strength improvement by utilizing room-temperature deformation twinning in a partially recrystallized VCrMnFeCoNi high-entropy alloy. *Nature Communications*, **2017**, 8, 15719	17.4	190
174	Interatomic Potential of Li□MnO and Molecular Dynamics Simulations on Li Diffusion in Spinel Li1□Mn2O4. *Journal of Physical Chemistry C*, **2017**, 121, 13008-13017	3.8	10
173	Modified embedded-atom interatomic potential for Fe-Ni, Cr-Ni and Fe-Cr-Ni systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2017**, 57, 98-106	1.9	33

172	Modified embedded-atom method interatomic potentials for Mg-Nd and Mg-Pb binary systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2017**, 57, 55-61	1.9	7
171	Effects of Mn and Mo addition on high-temperature tensile properties in high-Ni-containing austenitic cast steels used for turbo-charger application. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2017**, 682, 147-155	5.3	13
170	Second nearest-neighbor modified embedded-atom method interatomic potentials for the Pt-M (M = Al, Co, Cu, Mo, Ni, Ti, V) binary systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2017**, 59, 131-141	1.9	17
169	Design of new face-centered cubic high entropy alloys by thermodynamic calculation. *Metals and Materials International*, **2017**, 23, 839-847	2.4	48
168	Development and application of Ni-Ti and Ni-Al-Ti 2NN-MEAM interatomic potentials for Ni-base superalloys. *Computational Materials Science*, **2017**, 139, 225-233	3.2	14
167	Understanding on the Role of Rare Earth Elements in Activation of (leftlangle {text{c}} + {text{a}} rightrangle) Slip in Magnesium: An Atomistic Approach. *Minerals, Metals and Materials Series*, **2017**, 491-495		23
166	Computational screening of alloying elements for the development of sustainable V-based hydrogen separation membranes. *Journal of Membrane Science*, **2016**, 497, 270-281	9.6	6
165	3D simulations of grain growth in polycrystalline sheets and rods: Effects of free surface and shape of specimen. *Scripta Materialia*, **2016**, 110, 113-116	5.6	3
164	Effects of Cr and Nb addition on high-temperature tensile properties in austenitic cast steels used for turbo-charger application. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2016**, 677, 316-324	5.3	9
163	A modified embedded-atom method interatomic potential for ionic systems: 2NNMEAM+Qeq. *Physical Review B*, **2016**, 93,	3.3	11
162	Thermodynamic properties of phase-field models for grain boundary segregation. *Acta Materialia*, **2016**, 112, 150-161	8.4	11
161	An intermediate temperature creep model for Ni-based superalloys. *International Journal of Plasticity*, **2016**, 79, 153-175	7.6	33
160	{100} texture evolution in bcc Fe sheets - Computational design and experiments. *Acta Materialia*, **2016**, 106, 106-116	8.4	18
159	Effects of tungsten and molybdenum on high-temperature tensile properties of five heat-resistant austenitic stainless steels. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2016**, 656, 190-199	5.3	19
158	Novel strip-cast Mg/Al clad sheets with excellent tensile and interfacial bonding properties. *Scientific Reports*, **2016**, 6, 26333	4.9	4
157	Enhanced high temperature hydrogen permeation characteristics of V–Ni alloy membranes containing a trace amount of yttrium. *Scripta Materialia*, **2016**, 116, 122-126	5.6	16
156	Atomistic modeling of the Ti–Al binary system. *Computational Materials Science*, **2016**, 119, 1-8	3.2	28
155	Effect of Austenite Stability on Microstructural Evolution and Tensile Properties in Intercritically Annealed Medium-Mn Lightweight Steels. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2016**, 47, 2674-2685	2.3	35

154	Microstructural analysis of cracking phenomenon occurring during cold rolling of (0.1~0.7)C-3Mn-5Al lightweight steels. *Metals and Materials International*, **2015**, 21, 43-53	2.4	29
153	Novel ultra-high-strength (ferrite + austenite) duplex lightweight steels achieved by fine dislocation substructures (Taylor lattices), grain refinement, and partial recrystallization. *Acta Materialia*, **2015**, 96, 301-310	8.4	99
152	Modified embedded-atom interatomic potential for Co□W and Al□W systems. *Transactions of Nonferrous Metals Society of China*, **2015**, 25, 907-914	3.3	3
151	Modified embedded-atom method interatomic potentials for the Ni□Co binary and the Ni□Al□Co ternary systems. *Modelling and Simulation in Materials Science and Engineering*, **2015**, 23, 055004	2	23
150	Role of yttrium in activation of < c + a > slip in magnesium: An atomistic approach. *Scripta Materialia* , **2015**, 108, 104-108	5.6	76
149	Dynamic tension□compression asymmetry of martensitic transformation in austenitic Fe□(0.4, 1.0)C□18Mn steels for cryogenic applications. *Acta Materialia*, **2015**, 96, 37-46	8.4	25
148	Effects of Mn and Al contents on cryogenic-temperature tensile and Charpy impact properties in four austenitic high-Mn steels. *Acta Materialia*, **2015**, 100, 39-52	8.4	117
147	Modified embedded-atom method interatomic potentials for Mg□X (X=Y, Sn, Ca) binary systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2015**, 48, 27-34	1.9	51
146	Effect of a high angle grain boundary on deformation behavior of Al nanopillars. *Scripta Materialia*, **2015**, 107, 5-9	5.6	27
145	Atmospheric pressure plasma treatment on graphene grown by chemical vapor deposition. *Current Applied Physics*, **2015**, 15, 563-568	2.6	16
144	Improvement of interfacial bonding strength in roll-bonded Mg/Al clad sheets through annealing and secondary rolling process. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2015**, 628, 1-10	5.3	53
143	A Comparative Study on Hydrogen Diffusion in Amorphous and Crystalline Metals Using a Molecular Dynamics Simulation. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2014**, 45, 2906-2915	2.3	30
142	Governing factors for the formation of 4H or 6H-SiC polytype during SiC crystal growth: An atomistic computational approach. *Journal of Crystal Growth*, **2014**, 389, 120-133	1.6	17
141	Origin of unrealistic blunting during atomistic fracture simulations based on MEAM potentials. *Philosophical Magazine*, **2014**, 94, 1745-1753	1.6	19
140	Effects of Mn Addition on Tensile and Charpy Impact Properties in Austenitic Fe-Mn-C-Al-Based Steels for Cryogenic Applications. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2014**, 45, 5419-5430	2.3	35
139	A semi-empirical methodology to predict hydrogen permeability in amorphous alloy membranes. *Journal of Membrane Science*, **2014**, 472, 102-109	9.6	3
138	Theory for plasticity of face-centered cubic metals. *Proceedings of the National Academy of Sciences of the United States of America*, **2014**, 111, 6560-5	11.5	69
137	Design of sustainable V-based hydrogen separation membranes based on grain boundary segregation. *International Journal of Hydrogen Energy*, **2014**, 39, 12031-12044	6.7	16

136	Design of cost-effective Fe-based amorphous coating alloys having high amorphous forming ability by thermodynamic calculation. *Metals and Materials International*, **2014**, 20, 577-583	2.4	9
135	Phase-field modeling for 3D grain growth based on a grain boundary energy database. *Modelling and Simulation in Materials Science and Engineering*, **2014**, 22, 034004	2	43
134	Effects of Annealing Treatment Prior to Cold Rolling on the Edge Cracking Phenomenon of Ferritic Lightweight Steel. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2014**, 45, 3844-3856	2.3	17
133	Atomistic modeling for interfacial properties of Ni-Al-V ternary system. *Metals and Materials International*, **2014**, 20, 423-429	2.4	5
132	Microstructural Developments and Tensile Properties of Lean Fe-Mn-Al-C Lightweight Steels. *Jom*, **2014**, 66, 1857-1867	2.1	16
131	Structural changes during lithiation and delithiation of Si anodes in Li-ion batteries: A large scale molecular dynamics study. *Metals and Materials International*, **2014**, 20, 1003-1009	2.4	10
130	Effect of Mn Addition on Microstructural Modification and Cracking Behavior of Ferritic Light-Weight Steels. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2014**, 45, 5469-5485	2.3	11
129	Effects of Phosphorus and Carbon Contents on Amorphous Forming Ability in Fe-based Amorphous Alloys Used for Thermal Spray Coatings. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2013**, 44, 2573-2580	2.3	7
128	Effect of Tempering Time on Microstructure, Tensile Properties, and Deformation Behavior of a Ferritic Light-Weight Steel. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2013**, 44, 235-247	2.3	11
127	Effects of intergranular carbide precipitation on delayed fracture behavior in three TWinning Induced Plasticity (TWIP) steels. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2013**, 587, 85-99	5.3	32
126	Effect of annealing temperature on microstructural modification and tensile properties in 0.35 C□.5 Mn□.8 Al lightweight steel. *Acta Materialia*, **2013**, 61, 5050-5066	8.4	88
125	Thermodynamic analysis of the effect of C, Mn and Al on microstructural evolution of lightweight steels. *Scripta Materialia*, **2013**, 68, 339-342	5.6	25
124	Effects of aluminum content on cracking phenomenon occurring during cold rolling of three ferrite-based lightweight steel. *Acta Materialia*, **2013**, 61, 5626-5635	8.4	38
123	Prediction of hydrogen permeability in V□Al and V□Ni alloys. *Journal of Membrane Science*, **2013**, 430, 234-241	9.6	16
122	Manipulation of surface energy anisotropy in iron using surface segregation of phosphorus: An atomistic simulation. *Scripta Materialia*, **2013**, 68, 329-332	5.6	10
121	Atomistic simulation of hydrogen diffusion at tilt grain boundaries in vanadium. *Metals and Materials International*, **2013**, 19, 1221-1225	2.4	7
120	Modified embedded-atom method interatomic potentials for pure Y and the V□Pd□ ternary system. *Modelling and Simulation in Materials Science and Engineering*, **2013**, 21, 085008	2	12
119	Parallel three-dimensional Monte Carlo simulations for effects of precipitates and sub-boundaries on abnormal grain growth of Goss grains in Fe□%Si steel. *Philosophical Magazine*, **2013**, 93, 4198-4212	1.6	7

118	Intergranular embrittlement of iron by phosphorus segregation: an atomistic simulation. *Modelling and Simulation in Materials Science and Engineering*, **2013**, 21, 025012	2	10
117	Effect of alloying elements (Al, Co, Fe, Ni) on the solubility of hydrogen in vanadium: A thermodynamic calculation. *International Journal of Hydrogen Energy*, **2012**, 37, 7836-7847	6.7	20
116	Three-dimensional Monte Carlo simulation for the effect of precipitates and sub-boundaries on abnormal grain growth. *Scripta Materialia*, **2012**, 66, 398-401	5.6	18
115	Effects of Annealing Temperature on Microstructure and Tensile Properties in Ferritic Lightweight Steels. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2012**, 43, 843-853	2.3	40
114	Atomistic modeling of pure Li and Mg–Li system. *Modelling and Simulation in Materials Science and Engineering*, **2012**, 20, 035005	2	35
113	Atomistic modeling of an impurity element and a metal-impurity system: pure P and Fe-P system. *Journal of Physics Condensed Matter*, **2012**, 24, 225002	1.8	14
112	Tunable catalytic alloying eliminates stacking faults in compound semiconductor nanowires. *Nano Letters*, **2012**, 12, 855-60	11.5	16
111	Origin of hydrogen embrittlement in vanadium-based hydrogen separation membranes. *International Journal of Hydrogen Energy*, **2012**, 37, 13583-13593	6.7	20
110	Atomistic modeling of pure Co and Co–Al system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2012**, 38, 7-16	1.9	32
109	Effects of (Cr,Fe)2B borides on hardness in powder-injection-molded product fabricated with Fe-based alloy powders. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2012**, 556, 366-372	5.3	8
108	Effects of Cr and B Contents on Volume Fraction of (Cr,Fe)2B and Hardness in Fe-Based Alloys Used for Powder Injection Molding. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2012**, 43, 2237-2250	2.3	13
107	A modified embedded-atom method interatomic potential for the V–H system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2011**, 35, 302-307	1.9	8
106	Molecular dynamics simulation study of the effect of grain size on the deformation behavior of nanocrystalline body-centered cubic iron. *Scripta Materialia*, **2011**, 64, 494-497	5.6	73
105	An identification scheme of grain boundaries and construction of a grain boundary energy database. *Scripta Materialia*, **2011**, 64, 1152-1155	5.6	47
104	Correlation between plasticity and other materials properties of Cu–Zr bulk metallic glasses: An atomistic simulation study. *Acta Materialia*, **2011**, 59, 805-811	8.4	26
103	Size dependence in self-bending mechanism of Ge/Si bilayer nanofilms. *Journal of Applied Physics*, **2011**, 109, 074314	2.5	3
102	Atomistic modeling of the Al–H and Ni–H systems. *Journal of Materials Research*, **2011**, 26, 1552-1560	2.5	12
101	Modified embedded-atom method interatomic potential for the Fe-Al system. *Journal of Physics Condensed Matter*, **2010**, 22, 175702	1.8	17

100	The modified embedded-atom method interatomic potentials and recent progress in atomistic simulations. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2010**, 34, 510-522	1.9	112
99	Thermodynamic calculation on the stability of (Fe,Mn)3AlC carbide in high aluminum steels. *Journal of Alloys and Compounds*, **2010**, 505, 217-223	5.7	109
98	Modified embedded-atom method interatomic potentials for the Nb-C, Nb-N, Fe-Nb-C, and Fe-Nb-N systems. *Journal of Materials Research*, **2010**, 25, 1288-1297	2.5	16
97	The effect of porosity on the elasticity of pure titanium: An atomistic simulation. *Metals and Materials International*, **2010**, 16, 421-425	2.4	3
96	Effect of stress on self-diffusion in bcc Fe: An atomistic simulation study. *Scripta Materialia*, **2010**, 63, 39-42	5.6	24
95	Shear localization and the plasticity of bulk amorphous alloys. *Scripta Materialia*, **2010**, 63, 231-234	5.6	25
94	The formation of sub-10 nm nanohole array on block copolymer thin films on gold surface using surface neutralization based on O2 plasma treatment and self-assembled monolayer. *Surface Science*, **2010**, 604, 1034-1039	1.8	2
93	Atomistic modeling of III-V nitrides: modified embedded-atom method interatomic potentials for GaN, InN and Ga(1-x)In(x)N. *Journal of Physics Condensed Matter*, **2009**, 21, 325801	1.8	15
92	Atomistic modeling of the Cu□rAg bulk metallic glass system. *Scripta Materialia*, **2009**, 61, 801-804	5.6	18
91	Structural disordering of amorphous alloys: A molecular dynamics analysis. *Scripta Materialia*, **2009**, 61, 911-914	5.6	16
90	Intergranular segregation of Cr in Ti-stabilized low-Cr ferritic stainless steel. *Scripta Materialia*, **2009**, 61, 1133-1136	5.6	44
89	A Semi-Empirical Atomistic Approach in Materials Research. *Journal of Phase Equilibria and Diffusion* , **2009**, 30, 509-516	1	4
88	Size dependency of melting point of crystalline nano particles and nano wires: A thermodynamic modeling. *Metals and Materials International*, **2009**, 15, 531-537	2.4	31
87	Modified embedded-atom method interatomic potentials for pure Mn and the Fe□Mn system. *Acta Materialia*, **2009**, 57, 474-482	8.4	50
86	Modified embedded-atom method interatomic potentials for the Fe□Ti□C and Fe□Ti□N ternary systems. *Acta Materialia*, **2009**, 57, 3140-3147	8.4	73
85	Atomistic Modeling of pure Mg and Mg□Al systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2009**, 33, 650-657	1.9	88
84	Comparison of the Advantages Conferred by Mobility and Energy of the Grain Boundary in Inducing Abnormal Grain Growth Using Monte Carlo Simulations. *Materials Transactions*, **2009**, 50, 2521-2525	1.3	14
83	Role of A phase Separating Element on the Plasticity of Amorphous Alloys : Experiment and Atomic Simulation Study. *Korean Journal of Materials Research*, **2009**, 19, 79-84	0.2	

82	Understanding the Plasticity of Amorphous Alloys Via the Interpretation of Structural Evolution Inside a Shear Band. *Korean Journal of Materials Research*, **2009**, 19, 276-280	0.2	1
81	Structural characterization and stress-relaxation behavior of superlattice Cu5Zr. *Scripta Materialia*, **2008**, 58, 5-8	5.6	3
80	Modified embedded-atom method interatomic potentials for the FeNb and FeTi binary systems. *Scripta Materialia*, **2008**, 59, 595-598	5.6	31
79	A modified embedded-atom method interatomic potential for the CuZr system. *Journal of Materials Research*, **2008**, 23, 1095-1104	2.5	35
78	A modified embedded-atom method interatomic potential for indium. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2008**, 32, 82-88	1.9	16
77	A modified embedded-atom method interatomic potential for Germanium. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2008**, 32, 34-42	1.9	17
76	Thermodynamic analysis for the size-dependence of nanowire composition grown by a vapor–liquid–solid method. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2008**, 32, 669-674	1.9	13
75	Influence of Cu, Cr and C on the irradiation defect in Fe: A molecular dynamics simulation study. *Journal of Nuclear Materials*, **2008**, 373, 28-38	3.3	12
74	Order–disorder character of PbTiO3. *Journal of Physics Condensed Matter*, **2008**, 20, 015224	1.8	20
73	Kinetics of mesa overlayer growth: Climbing of adatoms onto the mesa top. *Applied Physics Letters*, **2008**, 92, 021909	3.4	8
72	Analysis and Prevention of Dent Defects Formed during Strip Casting of Twin-Induced Plasticity Steels. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2008**, 39, 1087-1098	2.3	8
71	Modified embedded-atom method interatomic potentials for the TiC and TiN binary systems. *Acta Materialia*, **2008**, 56, 3481-3489	8.4	98
70	Flat-surface, step-edge, facet–facet, and facet–step diffusion barriers in growth of a Pb mesa. *Surface Science*, **2008**, 602, 2284-2294	1.8	15
69	Effects of crystallographic structure and Cr on the rate of void nucleation in BCC Fe: An atomistic simulation study. *Metals and Materials International*, **2008**, 14, 283-290	2.4	1
68	Thermal decomposition of Li3AlH6 with TiAl3 catalyst. *Catalysis Today*, **2007**, 120, 292-297	5.3	9
67	A modified embedded-atom method interatomic potential for the FeH system. *Acta Materialia*, **2007**, 55, 6779-6788	8.4	55
66	Sputter erosion of Si(0 0 1) using a new silicon MEAM potential and different thermostats. *Nuclear Instruments & Methods in Physics Research B*, **2007**, 255, 195-201	1.2	26
65	A semi-empirical interatomic potential for the CuTi binary system. *Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing*, **2007**, 449-451, 733-736	5.3	10

64	Origin of the plasticity in bulk amorphous alloys. *Journal of Materials Research*, **2007**, 22, 3087-3097	2.5	83
63	Estimation of Relative Glass Forming Abilities of Multicomponent Alloy Systems. *Materials Transactions*, **2007**, 48, 1671-1674	1.3	
62	Thermodynamic Calculations on the Stability of Cu2S in Low Carbon Steels. *ISIJ International*, **2007**, 47, 163-171	1.7	31
61	Applications of computational thermodynamics the extension from phase equilibrium to phase transformations and other properties. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2007**, 31, 53-74	1.9	43
60	A modified embedded atom method interatomic potential for silicon. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2007**, 31, 95-104	1.9	71
59	Modified embedded-atom method interatomic potential for the FePt alloy system. *Journal of Materials Research*, **2006**, 21, 199-208	2.5	30
58	The origin of (001) texture evolution in FePt thin films on amorphous substrates. *Journal of Applied Physics*, **2006**, 99, 053906	2.5	92
57	Thermal destabilization of binary and complex metal hydrides by chemical reaction: A thermodynamic analysis. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2006**, 30, 65-69	1.9	70
56	Thermodynamic calculation of LiH<->Li3AlH6<->LiAlH4 reactions. *Journal of Alloys and Compounds*, **2006**, 420, 286-290	5.7	58
55	Thermodynamic assessment of the NaH<->Na3AlH6<->NaAlH4 hydride system. *Journal of Alloys and Compounds*, **2006**, 424, 370-375	5.7	30
54	A modified embedded-atom method interatomic potential for the FeC system. *Acta Materialia*, **2006**, 54, 701-711	8.4	129
53	A modified embedded-atom method interatomic potential for the FeN system: A comparative study with the FeC system. *Acta Materialia*, **2006**, 54, 4597-4607	8.4	58
52	Modified embedded-atom method interatomic potentials for Ti and Zr. *Physical Review B*, **2006**, 74,	3.3	145
51	A modified embedded atom method interatomic potential for carbon. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2005**, 29, 7-16	1.9	61
50	Modified embedded-atom method interatomic potential for the FeCu alloy system and cascade simulations on pure Fe and FeCu alloys. *Physical Review B*, **2005**, 71,	3.3	45
49	Prediction of composition dependency of glass forming ability of MgCuY alloys by thermodynamic approach. *Scripta Materialia*, **2005**, 52, 969-972	5.6	47
48	Strain hardening of an amorphous matrix composite due to deformation- induced nanocrystallization during quasistatic compression. *Applied Physics Letters*, **2004**, 84, 2781-2783	3.4	22
47	Computation of grain boundary energies. *Modelling and Simulation in Materials Science and Engineering*, **2004**, 12, 621-632	2	35

46	Behavior of amorphous materials under hydrostatic pressures: A molecular dynamics simulation study. *Metals and Materials International*, **2004**, 10, 467-474	2.4	31
45	Effect of microstructure on the cleavage fracture strength of low carbon MnNiMo bainitic steels. *Journal of Nuclear Materials*, **2004**, 324, 33-40	3.3	31
44	Deformation-induced nanocrystallization and its influence on work hardening in a bulk amorphous matrix composite. *Acta Materialia*, **2004**, 52, 1525-1533	8.4	82
43	A modified embedded atom method interatomic potential for the CuNi system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2004**, 28, 125-132	1.9	24
42	Thermodynamic approach for predicting the glass forming ability of amorphous alloys. *Intermetallics*, **2004**, 12, 1103-1107	3.5	26
41	Molecular dynamics simulation of the crystallization of a liquid gold nanoparticle. *Journal of Crystal Growth*, **2003**, 250, 558-564	1.6	49
40	Stress induced crystallization of amorphous materials and mechanical properties of nanocrystalline materials: a molecular dynamics simulation study. *Acta Materialia*, **2003**, 51, 6233-6240	8.4	37
39	Semiempirical atomic potentials for the fcc metals Cu, Ag, Au, Ni, Pd, Pt, Al, and Pb based on first and second nearest-neighbor modified embedded atom method. *Physical Review B*, **2003**, 68,	3.3	368
38	Modified embedded-atom method calculation for the NiW system. *Journal of Materials Research*, **2003**, 18, 1863-1867	2.5	12
37	Thermal stability of unsupported gold nanoparticle: a molecular dynamics study. *Surface Science*, **2002**, 512, 262-268	1.8	148
36	Monte Carlo Simulation of Phase Separation Behavior in a Cu-Co Alloy Nanoparticle. *Journal of Materials Research*, **2002**, 17, 925-928	2.5	5
35	Thermodynamic assessment of the Fe-Nb-Ti-C-N system. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **2001**, 32, 2423-2439	2.3	77
34	Effects of carbide precipitation on the strength and Charpy impact properties of low carbon MnNiMo bainitic steels. *Journal of Nuclear Materials*, **2001**, 297, 138-148	3.3	64
33	Evaluation of off-diagonal diffusion coefficient from phase diagram information. *Journal of Phase Equilibria and Diffusion*, **2001**, 22, 241-246		8
32	Estimation of order–disorder transition temperature in PtCo alloy by Monte Carlo simulation using modified embedded atom method. *Scripta Materialia*, **2001**, 45, 495-502	5.6	11
31	Second nearest-neighbor modified embedded atom method potentials for bcc transition metals. *Physical Review B*, **2001**, 64,	3.3	422
30	A semi-empirical atomic potential for the Fe-Cr binary system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **2001**, 25, 527-534	1.9	23
29	Second nearest-neighbor modified embedded-atom-method potential. *Physical Review B*, **2000**, 62, 8564-8567	3.3	430

28	Thermodynamic analysis of solid-state metal/Si interfacial reactions. *Journal of Materials Research*, **1999**, 14, 1002-1017	2.5	8
27	Numerical procedure for simulation of multicomponent and multi-layered phase diffusion. *Metals and Materials International*, **1999**, 5, 1-15		12
26	Investigation of the phase equilibria in the Sn-Bi-In alloy system. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **1999**, 30, 1503-1515	2.3	22
25	Numerical simulation of diffusional reactions between multiphase alloys with different matrix phases. *Scripta Materialia*, **1999**, 40, 573-579	5.6	15
24	Predictive Analysis of Ti/AlN Interfacial Reaction Using Diffusion Simulation. *Scripta Materialia*, **1998**, 38, 499-507	5.6	3
23	Calculation of □ equilibria in SA508 grade 3 steels for intercritical heat treatment. *Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science*, **1998**, 29, 1441-1447	2.3	20
22	Thermodynamic prediction of interface phases at Cu/solder joints. *Journal of Electronic Materials*, **1998**, 27, 1161-1166	1.9	78
21	Thermodynamics-aided alloy design and evaluation of Pb-free solder, SnBiInZn system. *Acta Materialia*, **1997**, 45, 951-960	8.4	101
20	Texture evolution by grain growth under a system of anisotropic grain boundary energy. *Scripta Materialia*, **1997**, 37, 1761-1767	5.6	14
19	Prediction of interface reaction products between Cu and various solder alloys by thermodynamic calculation. *Acta Materialia*, **1997**, 45, 1867-1874	8.4	204
18	Prediction of Ti/Al2O3 interface reaction products by diffusion simulation. *Acta Materialia*, **1997**, 45, 3993-3999	8.4	18
17	A thermodynamic study on the Ag?Sb?Sn system. *Journal of Alloys and Compounds*, **1996**, 238, 155-166	5.7	114
16	Thermodynamic assessments of the Sn-Zn and In-Zn binary systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1996**, 20, 471-480	1.9	72
15	Thermodynamic assessments of the Sn-In and Sn-Bi binary systems. *Journal of Electronic Materials*, **1996**, 25, 983-991	1.9	122
14	Revision of thermodynamic descriptions of the Fe-Cr & Fe-Ni liquid phases. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1993**, 17, 251-268	1.9	108
13	Effects of Temperature and Oxygen Partial Pressure on Nonstoichiometry of YBa2Cu3O6+□ *Journal of the American Ceramic Society*, **1993**, 76, 1609-1610	3.8	3
12	A thermodynamic evaluation of the Fe-Cr-Mn-C system. *Metallurgical and Materials Transactions A - Physical Metallurgy and Materials Science*, **1993**, 24, 1017-1025		21
11	A thermodynamic evaluation of the Cr-Mn and Fe-Cr-Mn systems. *Metallurgical and Materials Transactions A - Physical Metallurgy and Materials Science*, **1993**, 24, 1919-1933		50

10	On the stability of Cr carbides. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1992**, 16, 121-149	1.9	177
9	A thermodynamic evaluation of the Fe-Cr-V-C system. *Journal of Phase Equilibria and Diffusion*, **1992**, 13, 349-364		37
8	Thermodynamic Evaluation for the Y2O3BaOCuOx System. *Journal of the American Ceramic Society*, **1991**, 74, 78-84	3.8	90
7	A thermodynamic study on the FE-V-C system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1991**, 15, 293-306	1.9	11
6	A thermodynamic study on the V-C and FE-V systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1991**, 15, 283-291	1.9	16
5	Calculation of Phase Diagrams for the YO1.5BaOCuOx System. *Journal of the American Ceramic Society*, **1989**, 72, 314-319	3.8	49
4	A thermodynamic study on the MnC and FeMn systems. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1989**, 13, 345-354	1.9	23
3	A thermodynamic study on the FeMnC system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1989**, 13, 355-365	1.9	16
2	Formulation of the aL/L12 atomic ordering energy and a thermodynamic analysis of the Fe-Ni System. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1988**, 12, 393-403	1.9	5
1	Formulation of the A2/B2/D03 atomic ordering energy and a thermodynamic analysis of the Fe-Si system. *Calphad: Computer Coupling of Phase Diagrams and Thermochemistry*, **1987**, 11, 253-270	1.9	19