

# Carol A Handwerker

## List of Publications by Year in descending order

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83  
papers

2,727  
citations

218677

26  
h-index

182427

51  
g-index

91  
all docs

91  
docs citations

91  
times ranked

2174  
citing authors

#	ARTICLE	IF	CITATIONS
1	Hillock formation in $\hat{1}^2$ -Sn films during high frequency cyclic bending at low strains. Thin Solid Films, 2022, 741, 139027.	1.8	0
2	Analysis of enargite thin films synthesized from carbon-containing and novel carbon-free processing methods. Materials Science in Semiconductor Processing, 2022, 143, 106512.	4.0	2
3	Interfacial and volumetric melting regimes of Sn nanoparticles. Acta Materialia, 2022, 235, 118084.	7.9	1
4	Influence of Pad Surface Finish on the Microstructure Evolution and Intermetallic Compound Growth in Homogeneous Sn-Bi and Sn-Bi-Ag Solder Interconnects. Journal of Electronic Materials, 2021, 50, 6615-6628.	2.2	8
5	Orientation Relationships of Pure Tin on Single Crystal Germanium Substrates. Journal of Electronic Materials, 2020, 49, 140-151.	2.2	0
6	Local variations in grain formation, grain boundary sliding, and whisker growth along grain boundaries in large-grain Sn films. Scripta Materialia, 2020, 187, 458-463.	5.2	6
7	The use of decision support tools to accelerate the development of circular economic business models for hard disk drives and rare-earth magnets. MRS Energy & Sustainability, 2020, 7, 1.	3.0	9
8	Life cycle assessment of emerging technologies on value recovery from hard disk drives. Resources, Conservation and Recycling, 2020, 157, 104781.	10.8	30
9	Guiding the environmental design of a novel solar absorber through life cycle assessment by identifying anticipated hot spots. Journal of Cleaner Production, 2020, 258, 120847.	9.3	8
10	Shallow grain formation in Sn thin films. Acta Materialia, 2020, 192, 1-10.	7.9	5
11	Equilibrium and kinetic shapes of grains in polycrystals. Acta Materialia, 2020, 191, 101-110.	7.9	3
12	Fatigue Life of Sn <sub>3.0</sub> Ag <sub>0.5</sub> Cu Solder Alloy Under Combined Cyclic Shear and Constant Tensile/Compressive Loads. Journal of Electronic Packaging, Transactions of the ASME, 2020, 142, .	1.8	7
13	Reaction pathways and optoelectronic characterization of single-phase Ag <sub>2</sub> ZnSnS <sub>4</sub> nanoparticles. Journal of Materials Research, 2019, 34, 3810-3818.	2.6	8
14	Thermodynamic and Kinetic Effects on Microstructure Evolution in Hybrid Low Temperature Solder/High-Sn Solder Joints. , 2019, , .		0
15	Assessing the Potential Environmental Impact of Cu <sub>3</sub> As <sub>4</sub> PV Systems. , 2019, , .		1
16	Beta-Tin Grain Formation in Aluminum-Modified Lead-Free Solder Alloys. Journal of Electronic Materials, 2018, 47, 61-76.	2.2	12
17	Solution-processed copper arsenic sulfide thin films for photovoltaic applications. Journal of Materials Chemistry C, 2017, 5, 6913-6916.	5.5	14
18	Fabrication of Copper Arsenic Sulfide Thin Films from Nanoparticles for Application in Solar Cells. , 2017, , .		2

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19	An Evaluation of Effects of Molding Compound Properties on the Reliability of Ag Wire Bonded Components. , 2017, , .		2
20	The potential of amine-thiol based solution processing for chalcogenide photovoltaics. , 2016, , .		3
21	Rapid Solidification of Sn-Cu-Al Alloys for High-Reliability, Lead-Free Solder: Part I. Microstructural Characterization of Rapidly Solidified Solders. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2016, 47, 6507-6525.	2.2	3
22	Rapid Solidification of Sn-Cu-Al Alloys for High-Reliability, Lead-Free Solder: Part II. Intermetallic Coarsening Behavior of Rapidly Solidified Solders After Multiple Reflows. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2016, 47, 6526-6541.	2.2	4
23	Heterogeneous Stress Relaxation Processes at Grain Boundaries in High-Sn Solder Films: Effects of Sn Anisotropy and Grain Geometry During Thermal Cycling. Jom, 2016, 68, 2888-2899.	1.9	5
24	Advances in Pb-free Solder Microstructure Control and Interconnect Design. Journal of Phase Equilibria and Diffusion, 2016, 37, 369-386.	1.4	23
25	Metal-organic metal chalcogenide molecular precursors to binary, ternary, and quaternary metal chalcogenide thin films for electronic devices. Chemical Communications, 2016, 52, 5007-5010.	4.1	59
26	Growth of single crystalline seeds into polycrystalline strontium titanate: Anisotropy of the mobility, intrinsic drag effects and kinetic shape of grain boundaries. Acta Materialia, 2015, 95, 111-123.	7.9	41
27	A Versatile Solution Route to Efficient $\text{Cu}_2\text{ZnSn(S,Se)}_4$ Thin-Film Solar Cells. Chemistry of Materials, 2015, 27, 2114-2120.	6.7	80
28	Nucleation and Growth of Cu-Al Intermetallics in Al-Modified Sn-Cu and Sn-Ag-Cu Lead-Free Solder Alloys. Journal of Electronic Materials, 2015, 44, 842-866.	2.2	10
29	Optimization of Cu-Ag Core-Shell Solderless Interconnect Paste Technology. IEEE Transactions on Components, Packaging and Manufacturing Technology, 2015, 5, 910-920.	2.5	7
30	The equilibrium crystal shape of strontium titanate and its relationship to the grain boundary plane distribution. Acta Materialia, 2015, 82, 32-40.	7.9	54
31	Maximum entropy fracture model and its use for predicting cyclic hysteresis in $\text{Sn}_{3.8}\text{Ag}_{0.7}\text{Cu}$ and $\text{Sn}_{3.0}\text{Ag}_{0.5}$ solder alloys. Microelectronics Reliability, 2014, 54, 2513-2522.	1.7	14
32	Effect of crystallographic texture, anisotropic elasticity, and thermal expansion on whisker formation in $\text{In}_2\text{-Sn}$ thin films. Journal of Materials Research, 2014, 29, 197-206.	2.6	16
33	Evolution of tin whiskers and subsiding grains in thermal cycling. Journal of Materials Science, 2014, 49, 1099-1113.	3.7	21
34	Kesterite $\text{Cu}_2\text{ZnSn(S,Se)}_4$ Absorbers Converted from Metastable, Wurtzite-Derived $\text{Cu}_2\text{ZnSnS}_4$ Nanoparticles. Chemistry of Materials, 2014, 26, 3530-3534.	6.7	53
35	Emerging Science and Research Opportunities for Metals and Metallic Nanostructures. Jom, 2014, 66, 1321-1341.	1.9	9
36	Jet mill grinding of portland cement, limestone, and fly ash: Impact on particle size, hydration rate, and strength. Cement and Concrete Composites, 2013, 44, 41-49.	10.7	42

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37	A Predictive Model for Whisker Formation Based on Local Microstructure and Grain Boundary Properties. <i>Jom</i> , 2013, 65, 1350-1361.	1.9	7
38	Recrystallization as a nucleation mechanism for whiskers and hillocks on thermally cycled Sn-alloy solder films. <i>Materials Letters</i> , 2013, 99, 76-80.	2.6	20
39	Whisker and hillock growth via coupled localized Coble creep, grain boundary sliding, and shear induced grain boundary migration. <i>Acta Materialia</i> , 2013, 61, 1991-2003.	7.9	74
40	Controlling growth rate anisotropy for formation of continuous ZnO thin films from seeded substrates. <i>Nanotechnology</i> , 2013, 24, 195603.	2.6	11
41	Effects of local grain misorientation and $\hat{I}^2$ -Sn elastic anisotropy on whisker and hillock formation. <i>Journal of Materials Research</i> , 2013, 28, 747-756.	2.6	16
42	Effects of local grain misorientation and $\hat{I}^2$ -Sn elastic anisotropy on whisker and hillock formation $\hat{a}$ € <b>CORRIGENDUM</b>. <i>Journal of Materials Research</i> , 2013, 28, 785-785.	2.6	1
43	Utilizing the thermodynamic nanoparticle size effects for low temperature Pb-free solder. <i>Materials Science and Engineering B: Solid-State Materials for Advanced Technology</i> , 2012, 177, 197-204.	3.5	21
44	Silver layer instability in a SnO <sub>2</sub> /Ag/SnO <sub>2</sub> trilayer on silicon. <i>Thin Solid Films</i> , 2012, 520, 6189-6195.	1.8	18
45	Constitutive Behavior of Mixed Sn-Pb/Sn-3.0Ag-0.5Cu Solder Alloys. <i>Journal of Electronic Materials</i> , 2012, 41, 596-610.	2.2	9
46	GreenTV: A project-based learning module on sustainable electronics. , 2011, , .		0
47	Microvoid Formation at Solder $\hat{a}$ €Copper Interfaces During Annealing: a Systematic Study of the Root Cause. <i>Journal of Electronic Materials</i> , 2011, 40, 2415-2424.	2.2	10
48	Intrinsic and Interdiffusion in Cu-Sn System. <i>Journal of Phase Equilibria and Diffusion</i> , 2011, 32, 309-319.	1.4	93
49	Integrated Sustainable Life Cycle Design: A Review. <i>Journal of Mechanical Design, Transactions of the ASME</i> , 2010, 132, .	2.9	253
50	Fabrication of conductive interconnects by Ag migration in Cu $\hat{a}$ €Ag core-shell nanoparticles. <i>Applied Physics Letters</i> , 2010, 96, .	3.3	68
51	Defect Morphology and Texture in Sn, Sn $\hat{a}$ €Cu, and Sn $\hat{a}$ €Cu $\hat{a}$ €Pb Electroplated Films. <i>IEEE Transactions on Electronics Packaging Manufacturing</i> , 2010, 33, 159-164.	1.4	27
52	Comment on $\hat{a}$ €œSize-Dependent Melting Properties of Small Tin Particles: Nanocalorimetric Measurements $\hat{a}$ €• <i>Physical Review Letters</i> , 2010, 104, 189601.	7.8	9
53	A synchrotron micro-diffraction investigation of crystallographic texture of high-Sn alloy films and its effects on whisker growth. , 2010, , .		6
54	Formation of the ST12 phase in nanocrystalline Ge at ambient pressure. <i>Journal of Materials Chemistry</i> , 2010, 20, 331-337.	6.7	23

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55	Fundamental Properties of Pb-Free Solder Alloys. , 2007, , 21-74.		15
56	The Effect of Bi Contamination on the Solidification Behavior of Sn-Pb Solders. Journal of Electronic Materials, 2007, 36, 676-681.	2.2	7
57	Singular Grain Boundaries in Alumina and Their Roughening Transition. Journal of the American Ceramic Society, 2003, 86, 603-11.	3.8	50
58	Crystallographic Orientation-Dependent Dissolution Behavior of Sapphire in Anorthite Liquid Containing Chromia. Journal of the American Ceramic Society, 2003, 86, 1014-1018.	3.8	2
59	Grain Growth and Twin Formation in 0.74PMN-0.26PT. Journal of the American Ceramic Society, 2002, 85, 1581-1584.	3.8	39
60	Equilibrium Shape of Internal Cavities in Ruby and the Effect of Surface Energy Anisotropy on the Equilibrium Shape. Journal of the American Ceramic Society, 2002, 85, 1841-1844.	3.8	18
61	The effect of Pb contamination on the solidification behavior of Sn-Bi solders. Journal of Electronic Materials, 2001, 30, 45-52.	2.2	67
62	Faceting and Wetting Transitions of Anisotropic Interfaces and Grain Boundaries. Journal of the American Ceramic Society, 1999, 82, 1889-1900.	3.8	37
63	Equilibrium Shape of Internal Cavities in Sapphire. Journal of the American Ceramic Society, 1997, 80, 62-68.	3.8	137
64	Formation of alumina-chromia-chromium composites by a partial reduction reaction. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 1995, 195, 89-100.	5.6	11
65	Robert L. Coble: A Retrospective. Journal of the American Ceramic Society, 1994, 77, 293-297.	3.8	4
66	Stability and Surface Energies of Wetted Grain Boundaries in Aluminum Oxide. Journal of the American Ceramic Society, 1994, 77, 444-453.	3.8	81
67	Equilibrium geometries of anisotropic surfaces and interfaces. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 1993, 162, 83-95.	5.6	47
68	Morphology of grain growth in response to diffusion induced elastic stresses: cubic systems. Acta Metallurgica Et Materialia, 1993, 41, 1633-1642.	1.8	10
69	Texture Measurement of Sintered Alumina Using the Marchdollase Function. Advances in X-ray Analysis, 1993, 37, 473-478.	0.0	4
70	Overview No. 98 - Geometric models of crystal growth. Acta Metallurgica Et Materialia, 1992, 40, 1443-1474.	1.8	283
71	Determination of the prior austenitic grain size of selected steels using a molten glass etch. Journal of Heat Treating, 1991, 9, 37-47.	0.1	0
72	Metal Reference Line Technique for Obtaining Dihedral Angles from Surface Thermal Grooves. Journal of the American Ceramic Society, 1990, 73, 1365-1370.	3.8	29

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73	Dihedral Angles in Magnesia and Alumina: Distributions from Surface Thermal Grooves. Journal of the American Ceramic Society, 1990, 73, 1371-1377.	3.8	114
74	Thermodynamics and kinetics of reactions at interfaces in composites. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 1990, 126, 173-189.	5.6	35
75	Effects of Chemical Inhomogeneities on Grain Growth and Microstructure in Al <sub>2</sub> O <sub>3</sub> . Journal of the American Ceramic Society, 1989, 72, 130-136.	3.8	188
76	Sintering of Ceramics. , 1989, , 3-37.		9
77	Composition control of the microstructure of Ba <sub>2</sub> YCu <sub>3</sub> O <sub>6+x</sub> . Journal of Crystal Growth, 1988, 89, 93-100.	1.5	13
78	Microstructural Control through Diffusion-Induced Grain Boundary Migration. Materials Research Society Symposia Proceedings, 1987, 106, 127.	0.1	8
79	Effect of a Liquid Phase on the Morphology of Grain Growth in Alumina. Journal of the American Ceramic Society, 1987, 70, 339-343.	3.8	186
80	Observations on crystal defects associated with diffusion induced grain boundary migration in Cu-Zn. Scripta Metallurgica, 1986, 20, 937-942.	1.2	25
81	Effect of chemical composition on sintering of ceramics. Journal of Crystal Growth, 1986, 75, 138-160.	1.5	34
82	Nucleation kinetics of sodium disilicate. Journal of Crystal Growth, 1977, 42, 47-51.	1.5	34
83	Alloy Selection. , 0, , 9-46.		3