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2023

Improved oxidation resistance of (Zr-Nb-Hf-Ta)(C, N) high entropy carbonitrides.  

Carbon deficiency introduced plasticity of rock-salt-structured transition metal carbides.  

Joining graphite with ZrHfNbTa and TiZrHfTa high entropy alloy interlayers by spark plasma sintering.  

Simultaneous Increase in Dielectric Breakdown Strength and Thermal Conductivity of Oriented UHMWPE Containing Diamond Nanoparticles.  

Optimization of thermoelectric properties of carbon nanotube veils by defect engineering.  

Machine learning of carbon vacancy formation energy in high-entropy carbides.  

High-entropy MTIO3 perovskite oxides with glass-like thermal conductivity for thermoelectric applications.  

Relaxor ferroelectric behaviour observed in (Ca0.5Sr0.5Ba0.5Pb0.5)Nb2O7 perovskite layered structure ceramics.  

An overview of oxidation in hybrid and glass-based protective coatings for thermoelectric materials for medium-temperature range applications.  

Time dependent deformation of LaCoO3 based perovskites at different temperatures: ferroelastic and non-ferroelastic creep behaviour.  

2022

Ultra-low energy processing of graphite: a fast-track journey towards carbon neutrality.  
Grain orientation evolution and multi-scale interfaces enhanced thermoelectric properties of textured Sr0.9La0.1TiO3 based ceramics.

Terahertz Faraday Rotation of SrFe12O19 Hexaferrites Enhanced by Nb Doping.

The role of Cr addition on the processing and mechanical properties of high entropy carbides.

Ablation behavior of (HfTaZrNbTi)C high-entropy carbide and (HfTaZrNbTi)CxSiC composites.

Low thermal conductivity in A-site high entropy perovskite relaxor ferroelectric.

Dielectric polymer composites with ultra-high thermal conductivity and low dielectric loss.

Flash Spark Plasma Sintering of SiC: Impact of Additives.

A novel high-entropy perovskite ceramics Sr0.9La0.1(Zr0.25Sn0.25Ti0.25Hf0.25)O3 with low thermal conductivity and high Seebeck coefficient.

Ablation behaviour of (Hf-Ta-Zr-Nb)C high entropy carbide ceramic at temperatures above 2,100 C.

Thermal and electrical properties of a high entropy carbide (Ta, Hf, Nb, Zr) at elevated temperatures.

Synthesis, microstructure, and mechanical properties of novel high entropy carbonitriles.

The effects of dual-doping and fabrication route on the thermoelectric response of calcium cobaltite ceramics.

Low-cost Free-standing ferroelectric polymer films with high polarization produced via pressing-and-folding.

Synthesis and densification of (Zr-Hf-Nb-Ta)C-Co high entropy cermet prepared by pressureless melt infiltration using spark plasma sintering.

Thermoelectric Performance of n-Type Magnetic Element Doped Bi2S3.

Phase transformations in an Aurivillius layer structured ferroelectric designed using the high entropy concept.
Synthesis and thermoelectric properties of high-entropy half-Heusler MFe1xCoxSb (M = equimolar Ti, Zr, Hf, V, Nb, Ta).
Chen K, Zhang R, Bos JWG and Reece MJ. *Journal of Alloys and Compounds* vol. 892,.

High-entropy (Ca0.2Sr0.2Ba0.2La0.2Pb0.2)TiO3 perovskite ceramics with A-site short-range disorder for thermoelectric applications.

Densifying (Hf0.2Zr0.2Ta0.2Nb0.2Ti0.2)C high-entropy ceramics by two-step pressureless sintering.

Ultra-high energy density integrated polymer dielectric capacitors.

2021

Fabrication and characterisation of single-phase Hf2Al4C5 ceramics.

A review on advances in doping with alkali metals in halide perovskite materials.

Terahertz characterization of lead-free dielectrics for different applications.

Hardness anisotropy and active slip systems in a (Hf-Ta-Zr-Nb)C high-entropy carbide during nanoindentation.

Solidification microstructures of multielement carbides in the high entropy Zr-Nb-Hf-Ta-Cx system produced by arc melting.

High-Entropy Ceramics.

Scalable and environmentally friendly mechanochemical synthesis of nanocrystalline rhodostannite (Cu2FeSn3S8).

Enhanced mechanical and thermal properties of ferroelastic high-entropy rare-earth-niobates.


Strength analysis and stress-strain deformation behavior of 3 mol% y-tzp and 21 wt.% al2 o3-3 mol% y-tzp.

Low temperature densification mechanism and properties of Ta1-xHfxC solid solutions with decarbonization and phase transition of Cr3C2.

Effect of loading and heating history on deformation of lacoo3.
Thermally-insulated ultra-fast high temperature sintering (UHS) of zirconia: A master sintering curve analysis.

Pressure assisted flash sintering of Mn-Co based spinel coatings for solid oxide electrolysis cells (SOECs).

Pressureless sintering and properties of (Hf0.2Zr0.2Ta0.2Nb0.2Ti0.2)C high-entropy ceramics: The effect of pyrolytic carbon.

Ultrafast high-temperature sintering (UHS) of fine grained -Al2O3.


A review of electromagnetic processing of materials (EPM): Heating, sintering, joining and forming.

Dual-phase rare-earth-zirconate high-entropy ceramics with glass-like thermal conductivity.

Pyrochlore-fluorite dual-phase high-entropy ceramic foams with extremely low thermal conductivity from particle-stabilized suspension.

Oxidation resistance of (Hf-Ta-Zr-Nb)C high entropy carbide powders compared with the component monocarbides and binary carbide powders.

Electronic structure and thermal properties of Sm3+-doped La2Zr2O7: First-principles calculations and experimental study.

Thermoelectric Cu-S-Based Materials Synthesized via a Scalable Mechanochemical Process.

Fast synthesis of n-type half-heusler TiNiSn thermoelectric material.

Effect of processing on the structures and properties of bismuth sodium titanate compounds.

Multi elements substituted Aurivillius phase relaxor ferroelectrics using high entropy design concept.

Response to comment on point defect structure of La-doped SrTiO3 ceramics with colossal permittivity.
Ultra-low thermal conductivity and enhanced mechanical properties of high-entropy rare earth niobates (RE3NbO7, RE = Dy, Y, Ho, Er, Yb).


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Ultrafast Electric Field-Induced Phase Transition in Bulk Bi0.5Na0.5TiO3 under High-Intensity Terahertz Irradiation.

High Tunability and Low Loss in Layered Perovskite Dielectrics through Intrinsic Elimination of Oxygen Vacancies.

Low-loss High Entropy Relaxor-like Ferroelectrics with A-site Disorder.

Small scale fracture and strength of high-entropy carbide grains during microcantilever bending experiments.

Hierarchically porous lanthanum zirconate foams with low thermal conductivity from particle-stabilized foams.

The role of multi-elements and interlayer on the oxidation behaviour of (Hf-Ta-Zr-Nb)C high entropy ceramics.

Enhancing the thermoelectric performance of calcium cobaltite ceramics by tuning composition and processing.

Multiscale understanding of electric polarization in poly(vinylidene fluoride)-based ferroelectric polymers.

Oxidation protective glass coating for magnesium silicide based thermoelectrics.

Hybrid Flash-SPS of TiNiCu0.05Sn with reduced thermal conductivity.

Enhanced Hardness in High-Entropy Carbides Through Atomic Randomness.

Flash cold sintering: Combining water and electricity.

Structural and electronic evolution in the Cu3SbS4-Cu3SnS4solid solution.
Improved creep resistance of high entropy transition metal carbides.

Interfacial reaction between ZrNbHfTa foil and graphite: Formation of high-entropy carbide and the effect of heating rate on its microstructure.

Substitutional doping of hybrid organic-inorganic perovskite crystals for thermoelectrics.

Colossal thermoelectric enhancement in Cu2+xZn1xSnS4 solid solution by local disordering of crystal lattice and multi-scale defect engineering.

A review of cold sintering processes.

Highly textured and strongly anisotropic TiB2 ceramics prepared using magnetic field alignment (9T).

Photocatalytic activity of 2D nanosheets of ferroelectric Dion-Jacobson compounds.

Giant energy storage density in PVDF with internal stress engineered polar nanostructures.

High thermoelectric performance of Ca3Co4O9 ceramics with duplex structure fabricated via two-step pressureless sintering.

Effect of MnO2 on the microstructure and electrical properties of 0.83Pb(Zr1.5Ti0.5)O3-0.11Pb(Zn1/3Nb2/3)O3-0.06Pb(Ni1/3Nb2/3)O3 piezoelectric ceramics.

The contribution of electrical conductivity, dielectric permittivity and domain switching in ferroelectric hysteresis loops.
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Strength enhancement and slip behaviour of high-entropy carbide grains during micro-compression.
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Flash joining of conductive ceramics in a few seconds by flash spark plasma sintering.

Ultrahigh -phase content poly(vinylidene fluoride) with relaxor-like ferroelectricity for high energy density capacitors.

European Radioisotope Thermoelectric Generators (RTGs) and Radioisotope Heater Units (RHUs) for Space Science and Exploration.

The structure and thermoelectric properties of tungsten bronze Ba6Ti2Nb8O30.

High temperature stiffening of ferroelastic LaCoO 3.


A novel microstructural design to improve the oxidation resistance of ZrB2-SiC ultra-high temperature ceramics (UHTCs).

Flash spark plasma sintering of 3YSZ.

Mechanochemistry for Thermoelectrics: Nanobulk Cu 6 Fe 2 SnS 8 /Cu 2 FeSnS 4 Composite Synthesized in an Industrial Mill.

Microstructure and broadband dielectric properties of Zn 2 SiO 4 ceramics with nano-sized TiO 2 addition.

Twostep processing of thermoelectric (Ca 0.9 Ag 0.1 ) 3 Co 4 O 9 /nanosized Ag composites with high ZT.

High entropy Sr((Zr0.94Y0.06)0.2Sn0.2Ti0.2Hf0.2Mn0.2)O3x perovskite synthesis by reactive spark plasma sintering.

Anomalous slip of ZrB 2 ceramic grains during in-situ micropillar compression up to 500C.


Anisotropy and enhancement of thermoelectric performance of Sr0.8La0.067Ti0.8Nb0.2O3−: ceramics by graphene additions. Srivastava D, Norman C, Azough F, Ekren D, Chen K, Reece MJ, Kinloch IA and Freer R. Journal of Materials Chemistry A vol. 7, (42) 24602-24613.


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Bioactive sol-gel glass-coated wood-derived biocarbon scaffolds.
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In situ synthesis of m-type unfilled skutterudite with reduced thermal conductivity by hybrid Flash-Spark Plasma sintering.

Enhanced thermoelectric performance of Sn-doped Cu3SbS4.

Graphene-reinforced silicon oxycarbide composites prepared by phase transfer.
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Investigation of electrochemical, optical and thermal effects during flash sintering of 8YSZ.

DC-electro softening in soda lime silicate glass: An electro-thermal analysis.


Microstructure of (Hf-Ta-Zr-Nb)C high-entropy carbide at micro and nano/atomic level.

Preparation and properties of biomorphic potassium-based geopolymer (KGP)-biocarbon (CB) composite.

SrFe12O19 based ceramics with ultra-low dielectric loss in the millimetre-wave band.

Topotactic anion-exchange in thermoelectric nanostructured layered tin chalcogenides with reduced selenium content.

Enhanced thermoelectric performance of Cs doped BiCuSeO prepared through eco-friendly flux synthesis.

Tuning of Catalytic Activity by Thermoelectric Materials for Carbon Dioxide Hydrogenation.

Enhanced dielectric tunability and energy storage properties of plate-like Ba0.6Sr0.4TiO3/poly(vinylidene fluoride) composites through texture arrangement.


2017

Magnéli phase titanium suboxides by Flash Spark Plasma Sintering.

Understanding and quantification of grain growth mechanism in ZrO2carbon nanotube composites.

Influence of spark plasma sintering parameters on magnetic properties of FeCo alloy.

The effect of processing conditions on phase and microstructure of CaGeO3 ceramics.

Flash joining of CVD-SiC coated Cf/SiC composites with a Ti interlayer.

Impact of spark plasma sintering (SPS) on mullite formation in porcelains.

The deformation and fracture behaviors of 316L stainless steels fabricated by spark plasma sintering technique under uniaxial tension.

Rapid spark plasma sintering to produce dense UHTCs reinforced with undamaged carbon fibres.

Enhancement in thermoelectric performance of n-type Pb-deficit Pb-Sb-Te alloys.

High coercivity, anisotropic, heavy rare earth-free Nd-Fe-B by Flash Spark Plasma Sintering.

Peltier effect during spark plasma sintering (SPS) of thermoelectric materials.

Enhancement in the elongation, yield strength and magnetic properties of intermetallic FeCo alloy using spark plasma sintering.

Sintering trials of analogues of americium oxides for radioisotope power systems.

Crystallization kinetics and enhanced dielectric properties of free standing lead-free PVDF based composite films.

Pressureless spark plasmasintered Bioglass 45S5 with enhanced mechanical properties and stressinduced new phase formation.

Wetting and interfacial phenomena of Ni-Ta alloys on CVD-SiC.
Densification behaviour and physico-mechanical properties of porcelains prepared using spark plasma sintering.

Thermoelectric properties of highly-crystallized Ge-Te-Se glasses doped with Cu/Bi.

Flash spark plasma sintering of cold-Pressed TiB2-hBN.

Effect of ball-milling time on mechanical and magnetic properties.


Large-Scale Surfactant-Free Synthesis of p-Type SnTe Nanoparticles for Thermoelectric Applications.

Microstructural comparison of effects of hafnium and titanium additions in spark-plasma-sintered Fe-based oxide-dispersion strengthened alloys.

Effect of Phase Transitions on Thermal Depoling in Lead-Free 0.94(Bi0.5Na0.5TiO3)0.06(BaTiO3) Based Piezoelectrics.

Screening for CuS based 1 thermoelectric materials using crystal structure features.

Using graphene networks to build bioinspired self-monitoring ceramics.

Flash spark plasma sintering of magnesium silicide stannide with improved thermoelectric properties.

The impact of lone-pair electrons on the lattice thermal conductivity of the thermoelectric compound CuSbS2.

Spontaneous formation of interwoven porous channels in hard-wood-based hard-carbon for high-performance anodes in potassium-ion batteries.

2016


Theory-Guided Synthesis of an Eco-Friendly and Low-Cost Copper Based Sulfide Thermoelectric Material.
Joining of CVD-SiC coated and uncoated fibre reinforced ceramic matrix composites with pre-sintered Ti3SiC2 MAX phase using Spark Plasma Sintering.

Investigating the highest melting temperature materials: A laser melting study of the TaC-HfC system.

Non-congruence of high-temperature mechanical and structural behaviors of LaCoO3 based perovskites.

High temperature properties of the monolithic CVD -SiC materials joined with a pre-sintered MAX phase Ti3SiC2 interlayer via solid-state diffusion bonding.

Mechanical and magnetic properties of spark plasma sintered soft magnetic FeCo alloy reinforced by carbon nanotubes.


Growth of SiC platelets using contactless flash technique.


Processing and Characterization of Free Standing Highly Oriented Ferroelectric Polymer Films with Remarkably Low Coercive Field and High Remnant Polarization.

Synthesis and properties of graphene and graphene/carbon nanotube-reinforced soft magnetic FeCo alloy composites by spark plasma sintering.

Oxidation protective glassceramic coating for higher manganese silicide thermoelectrics.

Ultrafast-Contactless Flash Sintering using Plasma Electrodes.
Saunders T, Grasso S and Reece MJ. Scientific Reports vol. 6,.

Rapid Sintering of Anisotropic, Nanograined Nd-Fe-B by Flash-Spark Plasma Sintering.

Cyclic fatigue effect in particulate ceramic composites.

Effect of lateral size of graphene nano-sheets on the mechanical properties and machinability of alumina nano-composites.
Flash Spark Plasma Sintering (FSPS) of and SiC.

Graphene nanoplatelets loaded polyurethane and phenolic resin fibres by combination of pressure and gyration.

Perfluorinated polysiloxane hybridized with graphene oxide for corrosion inhibition of AZ31 magnesium alloy.

Ultra-Rapid Crystal Growth of Textured SiC Using Flash Spark Plasma Sintering Route.

Sintering behaviour, solid solution formation and characterisation of TaC, HfC and TaC-HfC fabricated by spark plasma sintering.

Plasticity in ZrB2 micropillars induced by anomalous slip activation.

Crystallographic Structure and Ferroelectricity of (AxA1-x)2Tl2O7 (A = Sm and Eu) Solid Solutions with High Tc.

Mechanical properties and residual stresses in ZrB2SiC spark plasma sintered ceramic composites.

Efficacy of lone-pair electrons to engender ultralow thermal conductivity.

Nanohardness and elastic anisotropy of ZrB2 crystals.

Ferroelectric materials for fusion energy applications.

2015

Limiting oxidation of ZrB2 by application of an electric field across its oxide scale.

2D Raman mapping and thermal residual stresses in SiC grains of ZrB2-SiC ceramic composites.

A High Curie Point Ferroelectric Ceramic Ca3(VO4)2.
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The effect of spark plasma sintering on lithium disilicate glass-ceramics.

Dielectric relaxation and electrical conductivity in Ca5Nb4TiO17 ceramics.
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Boron nitride nanosheets reinforced glass matrix composites.

Scratch behaviour of graphene alumina nanocomposites.

Role of synthesis method on microstructure and mechanical properties of graphene/carbon nanotube toughened Al2O3 nanocomposites.

Comprehensive study of tellurium based glass ceramics for thermoelectric application.

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Enhanced thermoelectric performance of porous magnesium tin silicide prepared using pressure-less spark plasma sintering.

Ceramic composites from mesoporous silica coated multi-wall carbon nanotubes.

4S5 BioglassMWCNT composite: processing and bioactivity.

Highly anisotropic single crystal-like La2Ti2O7 ceramic produced by combined magnetic field alignment and templated grain growth.

Thermal Diffusivity of SPS Pressed Silicon Powders and the Potential for Using BottomUp Silicon Quantum Dots as a Starting Material.

Observation of Curie transition during spark plasma sintering of ferromagnetic materials.

Processing and microstructure characterisation of oxide dispersion strengthened Fe-14Cr-0.4Ti-0.25Y2O3 ferritic steels fabricated by spark plasma sintering.

Role of synthesis method on microstructure and mechanical properties of graphene/carbon nanotube toughened Al2O3 nanocomposites.

Spark plasma sintered bismuth telluride-based thermoelectric materials incorporating dispersed boron carbide.

Nanoindentation and fracture toughness of nanostructured zirconia/multi-walled carbon nanotube composites.
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Reduced thermal conductivity by nanoscale intergrowths in perovskite like layered structure La2Ti2O7.

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Microwave and terahertz dielectric properties of MgTiO3-CaTiO3 ceramics.

Ferroelectric and dielectric properties of nd2xcexti2o7 ceramics.
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Improved lithium-storage capability and cyclability of tin dioxide confined in highly crosslinked graphene framework.

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Short range polar state transitions and deviation from Rayleigh-type behaviour in Bi0.5Na0.5TiO3-based perovskites.

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In-situ neutron diffraction of LaCoO3 perovskite under uniaxial compression. II. Elastic properties.

Toughening effect of multi-walled boron nitride nanotubes and their influence on the sintering behaviour of 3Y-TZP zirconia ceramics.
Processing and bioactivity of 45S5 Bioglass()-graphene nanoplatelets composites.

Physical, mechanical, and structural properties of highly efficient nanostructured n- and p-silicides for practical thermoelectric applications.

Processing and bioactivity of 45S5 Bioglass-graphene nanoplatelets composites.

Plasma formation during electric discharge (50V) through conductive powder compacts.

Large ZT enhancement in hot forged nanostructured p-type Bi0.5Sb1.5Te3 bulk alloys.

Joining of C/SiC composites by spark plasma sintering technique.

Effect of dysprosium substitution on crystal structure and physical properties of multiferroic BiFeO3 ceramics.

Influence of coated SiC particulates on the mechanical and magnetic behaviour of Fe-Co alloy composites.

Utilizing the phonon glass electron crystal concept to improve the thermoelectric properties of combined Yb-stuffed and Te-substituted CoSb3.

High field ZnO varistors prepared by spark plasma sintering.

Role of internal field and exhaustion in ferroelectric switching.

Mechanical and magnetic characterisation of SiC whisker reinforced Fe-Co alloy composites.

Effects of dispersion surfactants on the properties of ceramic-carbon nanotube (CNT) nanocomposites.

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Toughening effect of multi-walled boron nitride nanotubes and their influence on the sintering behaviour of 3Y-TZP zirconia ceramics.

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Boron nitride nanotubes as a reinforcement for brittle matrices.

Tribological properties of silica-graphene nano-platelet composites.

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Improvement of interfacial bonding in carbon nanotube reinforced Fe-50Co composites by Ni-P coating: Effect on magnetic and mechanical properties.

Effect of spark plasma sintering on the structure and properties of Ti1-xZrxNiSn half-Heusler alloys.

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Graphene reinforced alumina nano-composites.

Review of graphene-ceramic matrix composites.

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Structural and magnetic characterization of spark plasma sintered Fe-50Co alloys.

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Effects of zinc substitution on the dielectric properties of Ca5Nb4TiO17 microwave ceramics.

Effect of donor dopants cerium and tungsten on the dielectric and electrical properties of high Curie point ferroelectric strontium niobate.

Dielectric relaxation, lattice dynamics and polarization mechanisms in Bi0.5Na0.5TiO3-based lead-free ceramics.

Wear resistance of Al2O3-CNT ceramic nanocomposites at room and high temperatures.

Low-temperature spark plasma sintering of pure nano WC powder.

Microwave dielectric properties of CaO-La2O3-Nb 2O5-TiO2 ceramics.

Piezoelectric and dielectric properties of Ce substituted La2Ti2O7 ceramics.

Highly transparent -alumina obtained by low cost high pressure SPS.

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Utilizing the phonon glass electron crystal concept to improve the thermoelectric properties of combined Yb-stuffed and Te-substituted CoSb3.

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Ferroelectric ceramics with enhanced remnant polarization by ordered coalescence of nano-crystals.

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Cobalt-based orthopaedic alloys: Relationship between forming route, microstructure and tribological performance.
Shortened carbon nanotubes and their influence on the electrical properties of polymer nanocomposites.

Microstructural evolution during high-temperature oxidation of spark plasma sintered Ti2AlN ceramics.

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