

### Activities in the field of thermoelectrical materials including work done in cooperation

Antonio J. Paleo, Veronica M. Serrato, Jose M. Manuel, O. Toledano, Enrique Muñoz, Manuel Melle-Franco, Beate Krause, Petra Pötschke and Karin Lozano,

Doping effect of polyvinylidene fluoride on carbon nanofibers deduced by thermoelectric analysis of their melt mixed films, **Chinese Journal of Polymer Science** 2024, online, <https://doi.org/10.1007/s10118-024-3200-y>

Qusay Doraghi, Alina Żabńieska-Góra, Gabriele Voto, Beate Krause, Petra Pötschke, Ignacio Ezpeleta, Cintia Mateo-Mateo, Hussam Jouhara,

Experimental and computational thermoelectric generator for waste heat recovery for aeronautic application, **Energy** 2024, 297, 131286, <https://doi.org/10.1016/j.energy.2024.131286>

Franco di Persio, María Blecua, Ana Cecilia Chaine, Thomas Daue, Cintia Mateo-Mateo, Ignacio Ezpeleta, Petra Pötschke, Beate Krause, Ezgi Inci, Jürgen Pionteck, Timo Punkari, Jari Keskinen, Matti Mäntysalo, Amanda Melo, David Esteves,

Recyclability of novel energy harvesting and storage technologies for IoT and wireless sensor networks, **Journal of Cleaner Production** 2024, 435, 140525, <https://doi.org/10.1016/j.jclepro.2023.140525>

Victor Calvo, A. J. Paleo, J. M. González-Domínguez, E. Muñoz, B. Krause, P. Pötschke, W. K. Maser, A. M. Benito,

Thermoelectric N-type cotton textiles from aqueous inks based on carbon nanofibers and cellulose nanocrystals, **Carbon** 2024, 217, 118640; <https://doi.org/10.1016/j.carbon.2023.118640>

Cordelia Zimmerer, Frank Simon, Sascha Putzke, Astrid Drechsler, Andreas Janke and Beate Krause , N-Type Coating of Single-Walled Carbon Nanotubes by Polydopamine-Mediated Nickel Metallization, **Nanomaterials** 2023, 13(20), 2813; <https://doi.org/10.3390/nano13202813>

Antonio J. Paleo, Yadienka Martinez-Rubi, Beate Krause, Petra Pötschke, Michael B. Jakubinek, Behnam Ashrafi, Christopher Kingston,

Carbon Nanotube-Polyurethane Composite Sheets for Flexible Thermoelectric Materials, **ACS Applied Nano Materials**, 2023, 6 (19), 17986-17995 <https://doi.org/10.1021/acsnm.3c03247>

Beate Krause, Ioannis Konidakis, Emmanuel Stratakis, Petra Pötschke,

Change of Conduction Mechanism in Polymer/Single Wall Carbon Nanotube Composites upon Introduction of Ionic Liquids and their Investigation by Transient Absorption Spectroscopy: Implication for Thermoelectric Applications, **ACS Applied Nano Materials** 2023, 6, 13027–13036, <https://doi.org/10.1021/acsnm.3c01735>

Antonio J. Paleo, Beate Krause, Maria F. Cerqueira, Jose M. González-Domínguez, Enrique Muñoz, Petra Pötschke and Ana M. Rocha,

Thermoelectric Properties of Cotton Fabrics Dip-Coated in Pyrolytically Stripped Pyrograf® III Carbon Nanofiber Based Aqueous Inks, **Materials** 2023, 16(12), 4335; <https://doi.org/10.3390/ma16124335>

Ezgi Uçar, Mustafa Dogu, Elcin Demirhan, Beate Krause,

PMMA/SWCNT composites with very low electrical percolation threshold by direct incorporation and masterbatch dilution and characterization of electrical and thermoelectrical properties, **Nanomaterials** 2023, 13(8), 1431; <https://doi.org/10.3390/nano13081431>

Antonio Jose Paleo, Beate Krause, Fátima Cerqueira, Enrique Muñoz, Petra Pötschke, Carlos J. Tavares; Ana R. Mendes,  
Comparative Thermoelectric Properties of Polypropylene Composites Melt-Processed Using Pyrograf® III Carbon Nanofibers, **J. Compos. Sci.** 2023, 7(4), 173; <https://doi.org/10.3390/jcs7040173>

Qusay Doraghi, Alina Żabnieńska-Góra, Les Norman, Beate Krause, Petra Pötschke, Hussam Jouhara, Experimental and computational analysis of thermoelectric modules based on melt-mixed polypropylene composites, **Thermal Science and Engineering Progress** 2023, 101693, <https://doi.org/10.1016/j.tsep.2023.101693>

Beate Krause, Sarah Imhoff, Brigitte Voit, Petra Pötschke,  
Influence of Polyvinylpyrrolidone on Thermoelectric Properties of Melt-Mixed Polymer/Carbon Nanotube Composites, **Micromachines** 2023, 14(1), 181. <https://doi.org/10.3390/mi14010181>

Antonio José Paleo, Beate Krause, Delfim Soares, Manuel Melle-Franco, Enrique Muñoz, Petra Pötschke, Ana Maria Rocha,  
Thermoelectric Properties of N-Type Poly (Ether Ether Ketone)/Carbon Nanofiber Melt-Processed Composites, **Polymers**, 2022, 14(22), 4803, <https://doi.org/10.3390/polym14224803>

Beate Krause and Petra Pötschke,  
Polyethylene glycol as additive to achieve n-conductive melt-mixed polymer/carbon nanotube composites for thermoelectric application, **Nanomaterials** 2022, 12(21), 3812; <https://doi.org/10.3390/nano12213812>; <https://zenodo.org/record/7310074#.Y6BtwBWZPws>

Antonio José Paleo, Beate Krause, M. F. Cerqueira, Enrique Muñoz, Petra Pötschke and Ana Maria Rocha,  
Electronic features of cotton fabric e-textiles prepared with aqueous carbon nanofiber inks, **ACS Applied Engineering Materials**, 2023, 1(1), 122-131 <https://doi.org/10.1021/acsaenm.2c00023>.

Ioannis Konidakis, Beate Krause, Gyu-Hyeon Park, Nithin Pulumati, Heiko Reith, Petra Pötschke, Emmanuel Stratakis,  
Probing the carrier dynamics of polymer composites with single and hybrid carbon nanotube fillers for improved thermoelectric performance, **ACS Applied Energy Materials** 2022, 5, 9770–9781, <https://doi.org/10.1021/acsaem.2c01449>; <https://doi.org/10.48550/arXiv.2208.10283>

Oliver Voigt, Beate Krause, Petra Pötschke, Michael T. Müller, Sven Wießner,  
Thermoelectric performance of polypropylene/ carbon nanotube/ ionic liquid composites and its dependence on electron beam irradiation, **Journal of Composites Science** 2022, 6(1), 25, <https://doi.org/10.3390/jcs6010025>

Antonio J. Paleo, Beate Krause, Maria F. Cerqueira, Enrique, Muñoz, Petra Pötschke, Ana M. Rocha, Nonlinear thermopower behaviour of n-type carbon nanofibers and their melt mixed polypropylene composites, **Polymers**, 2022, 14(2), 269,  
<https://doi.org/10.3390/polym14020269>

Antonio José Paleo, Beate Krause, Maria Fátima Cerqueira, Manuel Melle-Franco, Petra Pötschke, Ana María Rocha, Thermoelectric properties of polypropylene carbon nanofiber melt-mixed composites: exploring the role of polymer on their Seebeck coefficient, **Polymer Journal** 2021, 53, 1145–1152,  
<https://doi.org/10.1038/s41428-021-00518-7>

Beate Krause, Alice Liguoro, Petra Pötschke, Blend Structure and n-Type Thermoelectric Performance of PA6/SAN and PA6/PMMA Blends Filled with Singlewalled Carbon Nanotubes, **Nanomaterials** 2021, 11(5), 1146,  
<https://doi.org/10.3390/nano11051146>

Katharina Kröning, Beate Krause, Petra Pötschke, Bodo Fiedler, Nanocomposites with p- and n-type conductivity controlled by type and content of nanotubes in thermosets for thermoelectric applications, **Nanomaterials** 2020, 10(6), 1144;  
<https://doi.org/10.3390/nano10061144>

Beate Krause, Ioannis Konidakis, Mohammad Arjmand, Uttandaraman Sundararaj, Robert Fuge, Marco Liebscher, Silke Hampel, Maxim Klaus, Efthymis Serpetzoglou, Emmanuel Stratakis, and Petra Pötschke, Nitrogen-doped Carbon Nanotube/Polypropylene Composites with Negative Seebeck Coefficient, **Journal of Composites Science** 2020, 4 (1), 14;  
<https://doi.org/10.3390/jcs4010014>

Beate Krause, Viktor Bezugly, Vyacheslav Khavrus, Liu Ye, Gianaurelio Cuniberti, and Petra Pötschke, Boron doping of SWCNTs as way to enhance thermoelectric properties of melt mixed polypropylene/SWCNT composites, **Energies**, 2020, 13(2), 394;  
<https://doi.org/10.3390/en13020394>

Wolfgang Jenschke, Mathias Ullrich, Beate Krause, Petra Pötschke, Messanlage zur Untersuchung des Seebeck-Effektes in Polymermaterialien – Measuring apparatus for study of Seebeck-effect in polymer materials, **Technisches Messen** 2020, 87(7-8), 495-503;  
<https://doi.org/10.1515/teme-2019-0152>

Beate Krause, Carine Barbier, Juhasz Levente, Maxim Klaus, Petra Pötschke, Screening of different carbon nanotubes in melt-mixed polymer composites with different polymer matrices for their thermoelectrical properties, **Journal of Composites Science** 2019, 3(4), 106;  
<https://doi.org/10.3390/jcs3040106>

Minoj Gnanaseelan, Sumanta Samanta, Jürgen Pionteck, Dieter Jehnichen, Frank Simon, Petra Pötschke, Brigitte Voit, Vanadium salt assisted solvothermal reduction of graphene oxide and the thermoelectric characterisation of the reduced graphene oxide in bulk and as composite, **Materials Chemistry and Physics** 2019, 229, 319-329,

<https://doi.org/10.1016/j.matchemphys.2019.03.002>

Petra Pötschke, Beate Krause, Jinji Luo,  
Melt mixed composites of polypropylene with single walled carbon nanotubes for thermoelectric applications: switching from p- to n-type behavior by additive addition, **AIP Conference Proceedings** 2019, 2055, 090004,  
<https://doi.org/10.1063/1.5084882>

P. Pötschke, B. Krause, J. Luo,  
Melt-mixed thermoplastic polymer/carbon nanotube composites for thermoelectric applications, **TechConnect Briefs** 2018, Volume 1, Advanced Materials, pp. 2018, 196 – 199;  
<https://briefs.techconnect.org/wp-content/volumes/TCB2018v1/pdf/496.pdf>

Petra Pötschke, Jinji Luo, Beate Krause, Marco Liebscher,  
Ways to enhance thermoelectric properties of melt mixed polypropylene-carbon nanotube composites, **ANTEC 2018** Orlando.

Minoj Gnanaseelan, Yian Chen, Jinji Luo, Beate Krause, Jürgen Pionteck, Petra Pötschke, and Haisong Qi,  
Cellulose-carbon nanotube composite aerogels as novel thermoelectric materials, **Composites Science and Technology** 2018, 163, 133-140,  
<https://doi.org/10.1016/j.compscitech.2018.04.026>

J. Gonçalves, P. Lima, B. Krause, P. Pötschke, U. Lafont, J. Gomes, C. Abreu, M. Paiva, J. Covas,  
Electrically Conductive Polyetheretherketone Nanocomposite Filaments: From Production to Fused Deposition Modeling, **Polymers** 2018, 10 (8), 925,  
<https://doi.org/10.3390/polym10080925>

Lazaros Tzounis, Maruti Hegde, Marco Liebscher, Theo Dingemans, Petra Pötschke, Alkiviadis. S. Paipetis, Nikolaos E. Zafeiropoulos, Manfred Stamm,  
All-aromatic SWCNT-Polyetherimide nanocomposites for thermal energy harvesting applications, **Composites Science and Technology** 2018, 156, 158-165,  
<https://doi.org/10.1016/j.compscitech.2017.12.030>

Jinji Luo, Petra Pötschke, and Beate Krause,  
Polymer Carbon Nanotube Composites for Thermoelectric Applications, lecture S02-34, Proceedings of PPS-32, Lyon, France, **AIP Conference Proceedings** 2017, 1914, 030001;  
<https://doi.org/10.1063/1.5016688> ; Published by AIP Publishing. 978-0-7354-1606-2

J. Luo, G. Cerretti, B. Krause, L. Zhang, T. Otto, W. Jenschke, M. Ullrich, W. Tremel, B. Voit, P. Pötschke,  
Polypropylene-based melt mixed composites with singlewalled carbon nanotubes for thermoelectric applications: Switching from p-type to n-type by the addition of polyethylene glycol, **Polymer** 2017, 108, 513-520,  
<https://doi.org/10.1016/j.polymer.2016.12.019>

Jinji Luo, Beate Krause, and Petra Pötschke,  
Melt-mixed thermoplastic composites containing carbon nanotubes for thermoelectric applications, **AIMS Materials Science** 2016, 3(3), 1107-1116,

<https://doi.org/10.3934/materci.2016.3.1107>

L. Tzounis, M. Liebscher, E. Mäder, P. Pötschke, M. Stamm, and S. Logothetidis,  
Thermal energy harvesting for large-scale applications using MWCNT-grafted glass fibers and  
polycarbonate-MWCNT nanocomposites, **AIP Conference Proceedings** 2015, 1646, 138;  
<https://doi.org/10.1063/1.4908594>

Lazaros Tzounis, Titus Gärtner, Marco Liebscher, Petra Pötschke, Manfred Stamm, Brigitte Voit, Gert  
Heinrich,  
Influence of a cyclic butylene terephthalate oligomer on the processability and thermoelectric properties  
of polycarbonate/MWCNT nanocomposites, **Polymer** 2014, 55 (21), 5381-5388,  
<https://doi.org/10.1016/j.polymer.2014.08.048>

M. Liebscher, T. Gärtner, L. Tzounis, M. Mičušík, P. Pötschke, M. Stamm, G. Heinrich, B. Voit,  
Influence of the MWCNT surface functionalization on the thermoelectric properties of melt-mixed  
polycarbonate composites, **Composites Science and Technology** 2014, 101, 133-138,  
<https://doi.org/10.1016/j.compscitech.2014.07.009>