

Xi Chen

Engineer | Materials & Corrosion Engineering

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Professional Profile

Dr. Chen specializes in the synthesis and characterization of advanced electrode materials for lithium ion batteries, as well as the design and fabrication of unconventional batteries for wearable devices. He has deep understanding in various electrolyte systems for lithium ion batteries, including organic, solid-state and aqueous electrolyte. Dr. Chen is highly experienced in electrochemical characterization methods including galvanostatic cycling with potential limitation (GCPL), cyclic voltammetry (CV), and galvanostatic intermittent titration technique (GITT). He utilizes transition electron microscopy (TEM), scanning electron microscopy (SEM), X-ray powder diffraction (XRD), atomic force microscopy (AFM) and energy-dispersive X-ray Spectroscopy (EDS) for material characterization in multiple size scales. Dr. Chen also has research experience in electrical packaging materials and surface plasma resonance.

Prior to joining Exponent, Dr. Chen was a graduate researcher at Swiss Federal Institute of Technology Zurich. He designed flexible and stretchable lithium ion batteries in thin-film configurations and prepared novel component materials to fabricate such batteries. He also discovered a general method for the synthesis of a class of transition metal sulfides that were used as advanced anode materials of lithium ion batteries.

Academic Credentials & Professional Honors

Ph.D., Material Science, ETH Zurich, Switzerland, 2020

M.Sc., Material Science, ETH Zurich, Switzerland, 2015

B.S., Material Science and Engineering, Tongji University, 2011

Languages

Chinese

Publications

Xi Chen, Elena Tervoort, Haijian Huang, Tian Liu, and Markus Niederberger. "SnS/N-Doped carbon composites with enhanced Li⁺ storage and lifetime by controlled hierarchical submicron-and nano-structuring." *CrystEngComm* (2020), 22, 1547 –1554

Huang, Haijian, Long Pan, Xi Chen, Elena Tervoort, Alla Sologubenko, and Markus Niederberger. "An advanced cathode material for high-power Li-ion storage full cells with a long lifespan." *Journal of Materials Chemistry A* 7, no. 39 (2019): 22444-22452.

Chen, Xi, Haijian Huang, Long Pan, Tian Liu, and Markus Niederberger. "Fully integrated design of a stretchable solid- state lithium- ion full battery." *Advanced Materials* 31, no. 43 (2019): 1904648.

Huang, Haijian, Tian Tian, Long Pan, Xi Chen, Elena Tervoort, Chih-Jen Shih, and Markus Niederberger. "Layered metal vanadates with different interlayer cations for high-rate Na-ion storage." *Journal of Materials Chemistry A* 7, no. 27 (2019): 16109-16116.

Huang, Haijian, Dipan Kundu, Runyu Yan, Elena Tervoort, Xi Chen, Long Pan, Martin Oschatz, Markus Antonietti, and Markus Niederberger. "Fast Na- Ion Intercalation in Zinc Vanadate for High- Performance Na- Ion Hybrid Capacitor." *Advanced Energy Materials* 8, no. 35 (2018): 1802800.

Huang, Haijian, Xing Wang, Elena Tervoort, Guobo Zeng, Tian Liu, Xi Chen, Alla Sologubenko, and Markus Niederberger. "Nano-sized structurally disordered metal oxide composite aerogels as high-power anodes in hybrid supercapacitors." *ACS nano* 12, no. 3 (2018): 2753-2763.

Zürcher, Jonas, Xi Chen, Brian R. Burg, Severin Zimmermann, Rahel Straessle, André R. Studart, and Thomas Brunswiler. "Enhanced percolating thermal underfills achieved by means of nanoparticle bridging necks." *IEEE Transactions on Components, Packaging and Manufacturing Technology* 6, no. 12 (2016): 1785-1795.

Brunswiler, Thomas, Jonas Zürcher, Severin Zimmermann, Brian R. Burg, Gerd Schlottig, Xi Chen, Tuhin Sinha et al. "Review of percolating and neck-based underfills with thermal conductivities up to 3 W/mK." In 2016 15th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm), pp. 140-150. IEEE, 2016.

Zürcher, Jonas, Xi Chen, Brian R. Burg, Severin Zimmermann, Thomas Brunswiler, Guo Hong, André R. Studart, Grzegorz Potasiewicz, and Piotr Warszyński. "Enhanced thermal underfills by bridging nanoparticle assemblies in percolating microparticle beds." In 2015 IEEE 15th International Conference on Nanotechnology (IEEE-NANO), pp. 577-580. IEEE, 2015.

Zeng, Guobo, Nan Shi, Michael Hess, Xi Chen, Wei Cheng, Tongxiang Fan, and Markus Niederberger. "A general method of fabricating flexible spinel-type oxide/reduced graphene oxide nanocomposite aerogels as advanced anodes for lithium-ion batteries." *ACS nano* 9, no. 4 (2015): 4227-4235.

Presentations

Xi Chen. Design of A Flexible and Stretchable Full-Cell Lithium-Ion-Battery Based on Hydrogel Electrolyte and Polymer Composite Current Collector. Oral presentation, 2018 Materials Research Society Fall Meeting, Boston, USA, 2018.

Xi Chen. SnS/N-doped C Composite with Enhanced Li-ion Storage and Lifetime by Controlled Hierarchical Submicron-/Nanostructuring. Poster presentation, 2018 Materials Research Society Fall Meeting, Boston, USA, 2018.

Xi Chen. A General Method for the Synthesis of Transition Metal Sulfides as Advanced Lithium Ion Battery Anodes. Poster presentation, 2017 European Materials Research Society Spring Meeting, Strasbourg, France, 2017.

Xi Chen. Improved Nanoparticle Assembly in Necks between Microparticles by Capillary Bridging. Oral presentation, 15th IEEE International Conference on Nanotechnology, Rome, Italy, 2015.