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PUBLICATIONS

Total-36 (Includes: 4 review articles and 3 book chapters)
Citations: 3164; h-index: 22, i10-index: 26
(Google scholar: https://scholar.google.com/citations?user=eJY5FOEAAAAJ&hl=en)

JOURNAL PUBLICATIONS

1. Hartel, J.; **Banik, A.**; Ali, M. Y.; Helm, B.; Strotmann, K.; Faka, V.; Maus, O.; Li, C.; Wiggers, H.; Zeier, W. G. Investigating the Influence of Transition Metal Substitution in Lithium Argyrodites on Structure, Transport, and Solid-State Battery Performance. *Chem. Mater.* 2024, *36* (21), 10731–10745.
2. **Banik, A.***; Samanta, B.; Helm, B.; Kraft, M. A.; Rudel, Y.; Li, C.; Hansen, M. R.; Lotsch, B. V.; Bette, S.; Zeier. W. G. Exploring Layered Disorder in Lithium-Ion-Conducting $Li_3Y_{1-x}In_xCl_6$. *Inorg. Chem.* 2024, 63(19), 8698–8709. (* = corresponding author)
3. Helm, B.; Strotmann, K.; Böger, T.; Samanta, B.; **Banik, A.**; Lange, M. A.; Li, Y.; Li, C.; Hansen, M. R.; Canepa, P.; Zeier, W. G. Reducing the Defect Formation Energy by Aliovalent Sn(+IV) and Isovalent P(+V) Substitution in Li_3SbS_4 Promotes Li^+ Transport. *ACS Appl. Energy Mater*. **2024**, 7(5), 1735–1747.
4. Hartel, J.; **Banik, A.**; Gerdes, J. M.; Wankmiller, B.; Helm, B.; Li, C.; Kraft, M. A.; Hansen, M. R.; Zeier, W. G. Understanding Lithium-Ion Transport in Selenophosphate-Based Lithium Argyrodites and Their Limitations in Solid-State Batteries. *Chem. Mater.* **2023**, 35 (12), 4798–4809.
5. Chatterjee, A.; Sachat, E. A.; **Banik, A.**; Biswas, K.; Castro-Alvarez, A.; Sotomayor Torres, C. M.; Santiso, J.; Chávez-Ángel, E. Improved High Temperature Thermoelectric Properties in Misfit $Ca_3Co_4O_9$ by Thermal Annealing. *Energies* (Basel) **2023**, 16, 5162.
6. Chatterjee, A.; **Banik, A.**; El Sachat, A.; Caicedo Roque, J. M.; Padilla-Pantoja, J.; Sotomayor Torres, C. M.; Biswas, K.; Santiso, J.; Chavez-Angel, E. Enhanced Thermoelectric Properties of Misfit $Bi_2Sr_{2-x}Ca_xCo_2O_y$: Isovalent Substitutions and Selective Phonon Scattering. *Materials* **2023**, 16 (4), 1413.
7. Helm, B.; Gronych, L.-M.; **Banik, A.**; Lange, M. A.; Li, C.; Zeier, W. G. Investigating the Li^+ substructure and ionic transport in $Li_{10}GeP_{2-x}Sb_xS_{12}$ ($0 \leq x \leq 0.25$). *Phys. Chem. Chem. Phys*. **2023**, 25, 1169-1176.
8. Pal, S.; Arora, R.; **Banik, A.**; Glazyrin, K. V.; Muthu, D. V. S.; Biswas, K.; Waghmare, U. V.; Sood, A. K. Pressure-induced topological and structural phase transitions in natural van der Waals heterostructures from the $(SnTe)_m(Bi_2Te_3)_n$ homologous family: Raman spectroscopy, x-ray diffraction, and density functional theory. *Phys. Rev. B* **2022**, 106, 134104.
9. Hogrefe, K.; Minafra, N.; Hanghofer, I.; **Banik, A.**; Zeier, W. G.; Wilkening, H M. R. Opening diffusion pathways through site disorder: the interplay of local structure and ion dynamics in the

solid electrolyte $Li_{6+x}P_{1-x}Ge_xS_5I$ as probed by neutron diffraction and NMR. *J. Am. Chem. Soc*. **2022**, 144, 1795–1812.

10. **Banik, A.**; Liu, Y.; Ohno, S.; Rudel, Y.; Jiménez-Solano, A.; Gloskovskii, A.; Vargas-Barbosa, N.; Mo, Y.; Zeier. W. Can substitutions affect the oxidative stability of lithium argyrodite solid electrolytes? *ACS Appl. Energy Mater*. **2022**, 5, 2045–2053.
11. Helm, B.; Schlem, R.; Wankmiller, B.; **Banik, A.**; Gautam, A.; Ruhl, J.; Li, C.; Hansen, M. R.; Zeier. W. G. Exploring aliovalent substitutions in the lithium halide superionic conductor $Li_{3-x}In_{1-x}Zr_xCl_6$ ($0 \leq x \leq 0.5$). *Chem. Mater*. **2021**, 33, 4773-4782.
12. Schlem, R.; **Banik, A.**; Ohno, S.; Suard, E.; Zeier. W. G. Insights into the lithium sub-structure of superionic conductors Li_3YCl_6 and Li_3YBr_6. *Chem. Mater*. **2021**, 33, 327-337.
13. **Banik, A.**; Famprikis, T.; Ghidiu, M.; Ohno, S.; Kraft, M. A.; Zeier. W. G. On the underestimated influence of synthetic conditions in solid ionic conductors. *Chem. Sci*. **2021**, 12, 6238-6263.
14. Schlem, R.; **Banik, A.**; Eckardt, M.; Zobel, M.; Zeier. W. G.; $Na_{3-x}Er_{1-x}Zr_xCl_6$—A Halide-based fast sodium-ion conductor with vacancy-driven ionic transport. *ACS App. Energy Mater*. **2020**, 3, 10164-10173.
15. Sarkar, D.; Ghosh, T.; **Banik, A.**; Roychowdhury, S.; Sanyal, D.; Biswas, K. Highly converged valence bands and ultralow lattice thermal conductivity for high-performance SnTe Thermoelectrics. *Angew. Chem., Int. Ed*. **2020**, 59, 11115-11122.
16. Ohno, S.; **Banik, A.**; Dewald, G. F.; Kraft, M. A.; Krauskopf, T.; Minafra, N.; Till, P.; Weiss, M.; Zeier, W. G. Materials design of ionic conductors for solid state batteries. *Prog. Energy* **2020**, 2, 022001.
17. Schlem, R.; Muy, S.; Prinz, N.; **Banik**, **A.;** Shao-Horn, Y.; Zobel, M.; Zeier, W. G. Mechanochemical synthesis: a tool to tune cation site disorder and ionic transport properties of Li_3MCl_6 (M = Y, Er) superionic conductors. *Adv. Energy Mater*. **2020**, 10, 1903719.
18. **Banik, A.**; Biswas, K. A game-changing strategy in SnSe thermoelectrics. *Joule* **2019**, 3, 636-638.
19. **Banik, A.**; Ghosh, T.; Arora, R.; Dutta, M.; Pandey, J.; Acharya, S.; Soni, A.; Waghmare, U. V.; Biswas, K. Engineering ferroelectric instability to achieve ultralow thermal conductivity and high thermoelectric performance in $Sn_{1-x}Ge_xTe$. *Energy Environ. Sci*. **2019**, 12, 589-595.
20. Haque, A.; **Banik**, **A.**; Varma, R. M.; Sarkar, I.; Biswas, K.; Santra, P. K. Understanding the chemical nature of the buried nanostructures in low thermal conductive Sb-doped SnTe by variable-energy photoelectron spectroscopy. *J. Phys. Chem. C* **2019**, 123, 10272-10279.
21. Roychowdhury, S.; Samanta, M.; **Banik, A.;** Biswas, K. Thermoelectric energy conversion and topological materials based on heavy metal chalcogenides. *J. Solid State Chem*. **2019**, 275, 103-123 (Review article).
22. **Banik**, **A.**; Roychowdhury, S.; Biswas K. Journey of tin chalcogenides towards high performance thermoelectrics and topological material. *Chem. Commun*. **2018**, 54, 6573-6590 (Feature article).
23. Chandra, S.; **Banik, A.**; Biswas, K. n-Type ultrathin few-layer nanosheets of Bi doped SnSe: Synthesis and thermoelectric properties. *ACS Energy Lett*. **2018**, 3, 1153-1158.
24. Pal, P.; Saha, S.;**Banik**, **A.**; Sarkar, A.; Biswas, K. All-solid-state mechanochemical synthesis and post-synthetic transformation of inorganic perovskite-type halides. *Chem. - Eur. J*. **2018**, 24, 1811-1815.
25. **Banik, A.**; Biswas, K. Synthetic nanosheets of natural van der Waals heterostructures. *Angew.*

Chem., Int. Ed. **2017**, 56, 14561-14566.

26. **Banik**, **A.**; Shenoy, U. S.; Saha, S.; Waghmare, U. V.; Biswas, K. High power factor and enhanced thermoelectric performance of SnTe-$AgInTe_2$: Synergistic effect of resonance level and valence band convergence. *J. Am. Chem. Soc*. **2016**, 138, 13068-13075.
27. Saha, S.; **Banik, A.**; Biswas, K. Few layer nanosheets of n-type $SnSe_2$. *Chem. - Eur. J*. **2016**, 22, 15634-15638.
28. **Banik**, **A.**; Vishal, B.; Perumal, S.; Datta, R.; Biswas, K. The origin of low thermal conductivity in $Sn_{1-x}Sb_xTe$: Phonon scattering via layered intergrowth nanostructures. *Energy Environ. Sci*. **2016**, 9, 2011-2019.
29. **Banik**, **A.**; Aggarwal, L.; Anand, S.; Waghmare, U. V.; Biswas, K.; Sheet, G. Local ferroelectricity in thermoelectric SnTe above room temperature driven by competing phonon instabilities and soft resonant bonding. *J. Materiomics* **2016**, 2, 196-202.
30. **Banik, A.;** Biswas, K. AgI alloying in SnTe boosts the thermoelectric performance via simultaneous valence band convergence and carrier concentration optimization. *J. Solid State Chem*. **2016**, 242, 43-49.
31. **Banik**, **A.**; Shenoy, U. S.; Anand, S.; Waghmare, U. V.; Biswas, K. Mg Alloying in SnTe facilitates valence band convergence and optimizes thermoelectric properties. *Chem. Mater*. **2015**, 27, 581-587.
32. **Banik, A.**; Biswas, K. Low-temperature soft-chemical synthesis and thermoelectric properties of barium-filled p-type skutterudite nanocrystals. *Mater. Sci. Semicond. Process* **2014**, 27, 593-598.
33. **Banik, A.**; Biswas, K. Lead free thermoelectrics: promising performance in p-type $SnTe_{1-x}Se_x$ system. *J. Mater. Chem. A* **2014**, 2, 9620-9625.

BOOK CHAPTER

1. **Banik**, **A**.; Agne M.; Zeier, W. Materials for thermoelectric devices. Applied Inorganic Chemistry vol2, De Gruyter, **2022**, 26.
2. **Banik**, **A.**; Perumal, S.; Biswas, K. Thermoelectric properties of metal chalcogenides nanosheets and nanofilms grown by chemical and physical routes. Thermoelectric Thin Films: Materials and Devices, Springer International Publishing, **2019**, 157-184.
3. Guin, S. N.; **Banik, A.**; Biswas, K. Thermoelectric energy conversion in layered metal Chalcogenides. 2d Inorganic Materials Beyond Graphene, 2018, 239-274.