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Editorial

A New Year and 35 Years of *Chemistry of Materials*

Cite This: *Chem. Mater.* 2023, 35, 1−8

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As we welcome 2023, the entire team at *Chemistry of Materials* thanks the authors, reviewers, and readers of the journal. Every issue of the journal is a pleasure to read because of the exceptional research being featured, with nearly 1000 manuscripts published and comments from nearly 2500 reviewers analyzed by our editors in 2022. We know that a lot of hard work and time goes into every manuscript, and we appreciate your contributions. We are also excited by the voices that advance materials chemistry and provide unique viewpoints through editorials, special collections, and perspectives, including the journal's *Up & Coming* series, and the community celebrations, for example, the special collection for John Goodenough's 100th brithday![1] We thank you all for your continued engagement with the journal and wish you the best in 2023.

This continued community engagement positions *Chemistry of Materials* well as we enter our 35th year! Such anniversaries are often celebrated with gifts of jade, which is a beautiful mineral. In fact, what is commonly referred to as "jade" can be one of two different minerals—nephrite or jadeite, with different chemical compositions and different properties. Regardless of the form, utilitarian and ceremonial uses for jade have been documented throughout much of human history and in many geographical regions. In a similar manner, materials research often transcends borders to bring understanding to the chemical nature and properties of materials and ultimately bring forward their utility in a host of applications. We celebrate the journal's history as the premier home for research providing a molecular-level viewpoint of materials.[2]

With this framework, 2023 will be marked with community-driven special collections that place current frontiers in materials chemistry within the longevity of the field that has been fostered by the journal. Keep your eyes on the journal and our Twitter handle @ChemMater for special collections on the *Future of Drug Delivery* and *π-Conjugated Materials*, being launched early this year. Our "35 Voices" initiative will also begin so that we may hear what motivates materials researchers from all over the world. To kick off our 35th year, however, we start by highlighting 35 of the most cited and downloaded manuscripts published in 2022.[3−37]

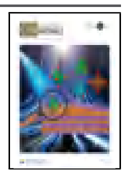
As can be anticipated, many of the most engaged with contributions to the journal are in the area of battery materials, being part of the special collection celebrating John Goodenough's 100th birthday (Table 1)[1,3−10] and highlighted in the virtual collection *Solid Electrolytes in the Spotlight*.[38] Both advances in the electrode materials and electrolytes are highlighted, and this topical area includes a review article on solid Li- and Na-ion electrolytes.[7]

MXenes and layered dichalcogenides (Table 2)[11−15] as well as covalent organic framework (COF) materials (Table 3)[16−22] were also well-represented. The contributions on MXenes include a Methods/Protocols paper that provides practical insights for the synthesis and processing of these exciting materials.[13] The multifunctionality of COFs continues to be advanced as highlighted by Sun and co-workers with the introduction of a photoresponsive switch for singlet oxygen generation,[17] with exceptional properties also being predicted and likely to inspire new experimental directions.[19] Yet the interest in porous materials does not end with COFs; several papers on porous carbons have been appreciated by the community, giving guidance on the important structural features for diverse applications,[21,22] and porous materials were center-points of the recent collections *Highlighting Recent Research in Materials Science from Latin America*[39] and *Multifunctional Nanoporous Materials in Latin America*.[40]

Hydrogels also were prominent in *Chemistry of Materials* this past year, with a special collection curated by Dayong Yang.[41] Two manuscripts are highlighted in Table 4,[23,24] and we recall the virtual celebration of Meng Li, Dr. Baolin Guo, and their team for their best paper award. At the time of this writing, their paper entitled "Two-Pronged Strategy of Biomechanically Active and Biochemically Multifunctional Hydrogel Wound Dressing to Accelerate Wound Closure and Wound Healing" has already been cited 185 times![42] This recognition is appropriate given the innovation demonstrated through the integration of quaternized chitosan, polydopamine-coated reduction graphene oxide, and poly(*N*-isopropylacrylamide).

Catalysts, photovoltaic materials, and thermoelectrics also continue to be important topics given their connection to a sustainable future (Table 5),[25−29] with two exciting perspectives—one on codesign for oxygen evolution catalysts[26] and the other on halogen bonding in hybrid perovskite photovoltaics.[27] A useful Methods/Protocols article accompanies these contributions on best practices for the creation of perovskite solar cells.[28] Luminescent and optical materials (Table 6)[30−35] of all classes round-out the interest in sustainability, while also connecting to detector and sensor applications. Our list of 35 papers concludes with materials discovery (Table 7),[36,37] which should push us to new frontiers. A notable feature of this work

Published: January 10, 2023



https://doi.org/10.1021/acs.chemmater.2c03747
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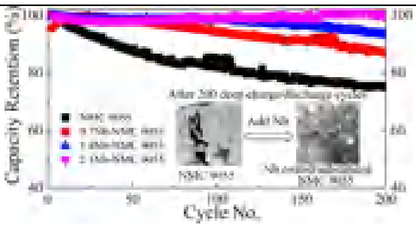
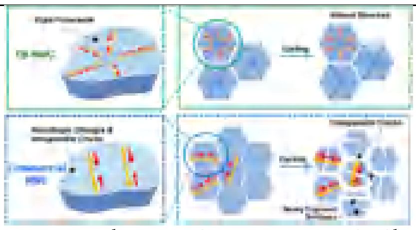
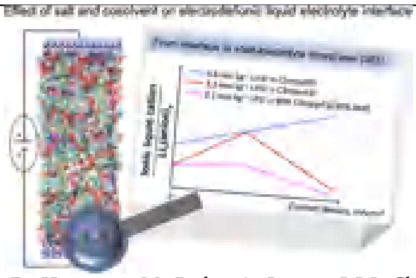
Table 1. Battery Materials



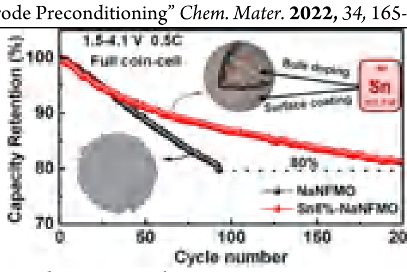
Xin, F.; Goel, A.; Chen, X.; Zhou, H.; Bai, J.; Liu, S.; Wang, F.; Zhou, G.; Whittingham, M. S. "Electrochemical Characterization and Microstructure Evolution of Ni-Rich Layered Cathode Materials by Niobium Coating/Substitution" *Chem. Mater.* **2022,** *34,* 7858-7866.



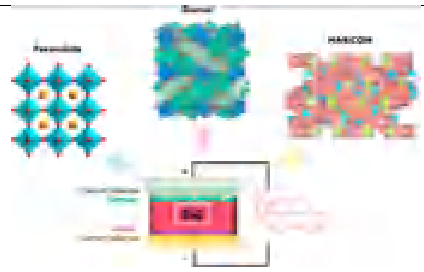
Chung, H.; Li, Y.; Zhang, M.; Grenier, A.; Mejia, C.; Cheng, D.; Sayahpour, B.; Song, C.; Shen, M. H.; Huang, R.; Wu, E. A.; Chapman, K. W.; Kim, S. J.; Meng, Y. S. "Mitigating Anisotropic Changes in Classical Layered Oxide Materials by Controlled Twin Boundary Defects for Long Cycle Life Li-Ion Batteries" *Chem. Mater.* **2022,** *34,* 7302-7312.



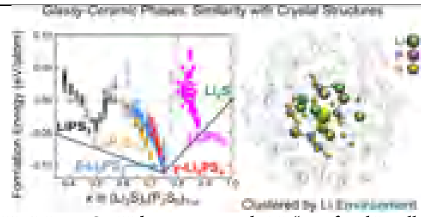
Rakov, D.; Hasanpoor, M.; Baskin, A.; Lawson, J. W.; Chen, F.; Cherepanov, P. V.; Simonov, A. N.; Howlett, P. C.; Forsyth, M. "Understanding the Effects of Electrolyte Composition and Electrode Preconditioning" *Chem. Mater.* **2022,** *34,* 165-177.



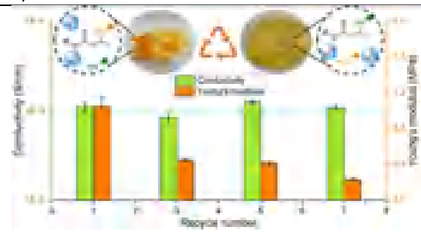
Song, T.; Chen, L.; Gastol, D.; Dong, B.; Marco, J. F.; Berry, F.; Slater, P.; Reed, D.; Kendrick, E. "High-Voltage Stabilization of O3-Type Layered Oxide for Sodium-Ion Batteries by Simultaneous Tin Dual Modification" *Chem. Mater.* **2022,** *34,* 4153-4165.



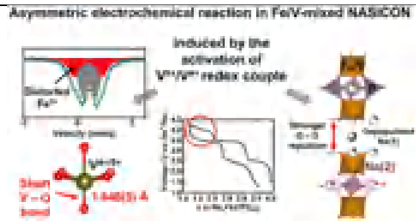
Review. Thangadurai, V.; Chen, B. "Solid Li- and Na-Ion Electrolytes for Next Generation Rechargeable Batteries" *Chem. Mater.* **2022,** *34,* 6637-6658.



Guo, H.; Wang, Q.; Urban, A.; Artrith, N. "Artificial Intelligence-Aided Mapping of the Structure-Composition-Conductivity Relationships of Glass-Ceramic Lithium Thiophosphate Electrolytes" *Chem. Mater.* **2022,** *34,* 6702-6712.



Lin, Y.; Chen, Y.; Yu, Z.; Huang, Z.; Lai, J.-C.; Tok, J. B.-H.; Cui, Y.; Bao, Z. "Reprocessable and Recyclable Polymer Network Electrolytes via Incorporation of Dynamic Covalent Bonds" *Chem. Mater.* **2022,** *34,* 2393-2399.



Park, S.; Chotard, J.-N.; Carlier, D.; Moog, I.; Duttine, M.; Fauth, F.; Iadecola, A.; Croguennec, L.; Masquelier, C. "An Asymmetric Sodium Extraction/Insertion Mechanism for the Fe/V-Mixed Nasicon $Na_4FeV(PO_4)_3$" *Chem. Mater.* **2022,** *34,* 4142-4152.

https://doi.org/10.1021/acs.chemmater.2c03747
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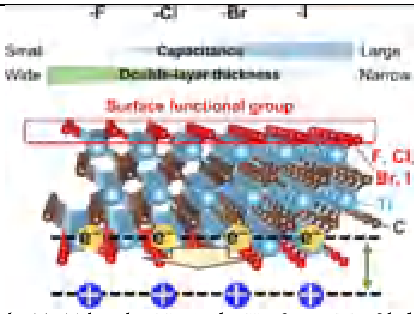
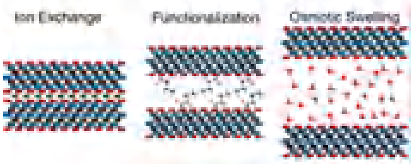
Table 2. MXenes and Layered Dichalcogenides

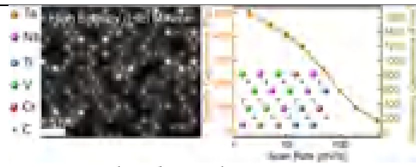


Shimada, T.; Takenaka, N.; Ando, Y.; Otani, M.; Okubo, M.; Yamada, A. "Relationship between Electric Double-Layer Structure of MXene Electrode and Its Surface Functional Groups" *Chem. Mater.* **2022,** *34,* 2069-2075.

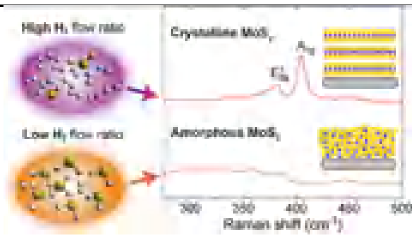


Natu, V.; Pai, R.; Wilson, O.; Gadasu, E.; Badr, H.; Karmakar, A.; Magenau, A. J. D.; Kalra, V.; Barsoum, M. W. "Effect of Base/Nucleophile Treatment on Interlayer Ion Intercalation Surface Terminations, and Osmotic Swelling of $Ti_3C_2T_z$ Mxene Multilayers" *Chem. Mater.* **2022,** *34,* 678-693.

Methods/Protocols. Matthews, K.; Zhang, T.; Shuck, C. E.; VahidMohammadi, A.; Gogotsi, Y. "Guidelines for Synthesis and Processing of Chemically Stable Two-Dimensional V_2CT_xMXene" *Chem. Mater.* **2022,** *34,* 499-509.



Zhou, J.; Tao, Q.; Ahmed, B.; Palisaitis, J.; Persson, I.; Halim, J.; Barsoum, M. W.; Persson, P. O. A.; Rosen, J. "High-Entropy Laminate Metal Carbide (MAX Phase) and Its Two-Dimensional Derivative Mxene" *Chem. Mater.* **2022,** *34,* 2098-2106.



Mattinen, M.; Gity, F.; Coleman, E.; Vonk, J. F. A.; Verheijen, M. A.; Duffy, R.; Kessels, W. M. M.; Bol A. A. "Atomic Layer Deposition of Large-Area Polycrystalline Transition Metal Dichalcogenides from 100 °C through Control of Plasma Chemistry" *Chem. Mater.* **2022,** *34,* 7280-7292.

https://doi.org/10.1021/acs.chemmater.2c03747
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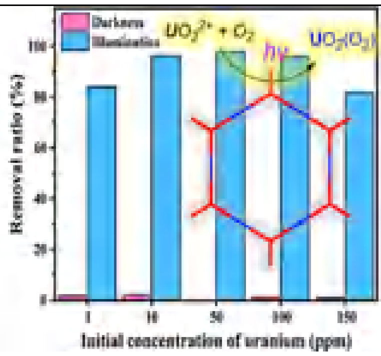
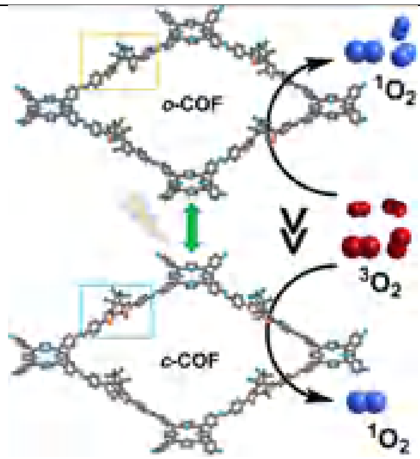
Table 3. COFs and Porous Materials



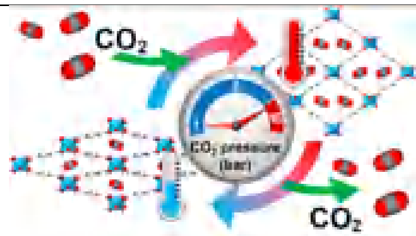
Song, Y.; Li, A.; Li, P.; He, L.; Xu, D.; Wu, F.; Zhai, F.; Wu, Y.; Hu, K.; Wang, S.; Sheridan, M. "Unassisted Uranyl Photoreduction and Separation in a Donor-Acceptor Covalent Organic Framework" *Chem. Mater.* **2022,** *34,* 2771-2778.



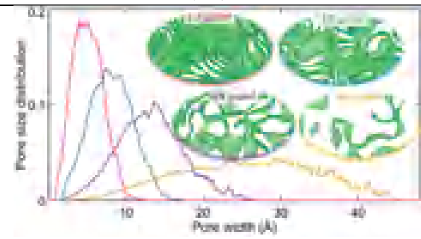
Sun, N.; Jin, Y.; Wang, H.; Yu, B.; Wang, R.; Wu, H.; Zhou, W.; Jiang, J. "Photoresponsive Covalent Organic Frameworks with Diarylethene Switch for Tunable Singlet Oxygen Generation" *Chem. Mater.* **2022,** *34,* 1956-1964.

Maschita, J.; Banerjee, T.; Lotsch, B. V. "Direct and Linker-Exchange Alcohol-Assisted Hydrothermal Synthesis of Imide-Linked Covalent Organic Frameworks" *Chem. Mater.* **2022,** *34,* 2249-2258.

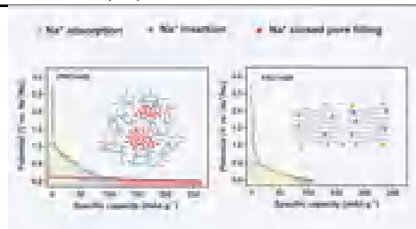
Ni, X.; Huang, H.; Brédas, J.-L. "Emergence of a Two-Dimensional Topological Dirac Semimetal Phase in a Phthalocyanine-Based Covalent Organic Framework" *Chem. Mater.* **2022,** *34,* 3178-3184.



García-Ben, J.; López-Beceiro, J.; Artiaga, R.; Salgado-Beceiro, J.; Delgado-Ferreiro, I.; Kolen'ko, Y. V.; Casto-García, S.; Señarís-Rodríguez, M. A.; Sánchez-Andújar, M.; Bermúdez-García, J. M. "Discovery of Colossal Breathing-Caloric Effect under Low Applied Pressure in the Hybrid Organic-Inorganic MIL-53(Al) Material" *Chem. Mater.* **2022,** *34,* 3323-3332.



Wang, Y.; Fan, Z.; Qian, P.; Ala-Nissila, T.; Caro, M. A. "Structure and Pore Size Distribution in Nanoporous Carbon" *Chem. Mater.* **2022,** *34,* 617-628.



Yuan, M.; Cao, B.; Liu, H.; Meng, C.; Wu, J.; Zhang, S.; Li, A.; Chen, X.; Song, H. "Sodium Storage Mechanism of Nongraphitic Crabons: A General Model and the Function of Accessible Closed Pores" *Chem. Mater.* **2022,** *34,* 3489-3500.

https://doi.org/10.1021/acs.chemmater.2c03747
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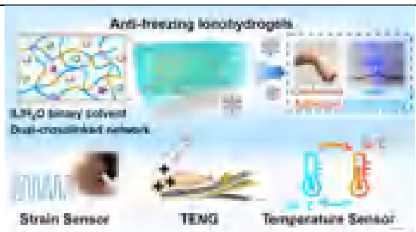
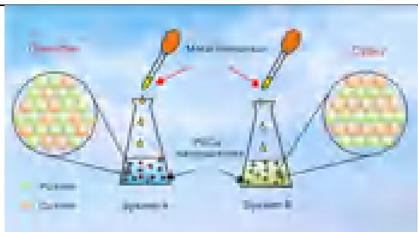
Table 4. Hydrogels



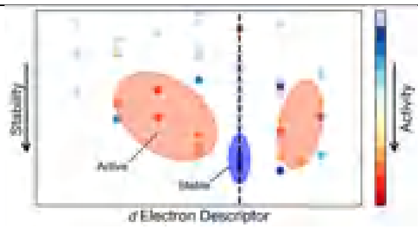
Zhang, X.; Cui, C.; Chen, S.; Meng, L.; Zhao, H.; Xu, F.; Yang, J. "Adhesive Ionohydrogels Based on Ionic Liquid/Water Binary Solvents with Freezing Tolerance for Flexible Ionotronic Devices" *Chem. Mater.* **2022,** *34,* 1065-1077.

Guo, H.; Huang, S.; Xu, A.; Xue, W. "Injectable Adhesive Self-Healing Multiple-Dynamic-Bond Crosslinked Hydrogel with Photothermal Antibacterial Activity for Infected Wound Healing" *Chem. Mater.* **2022,** *34,* 2655-2671.

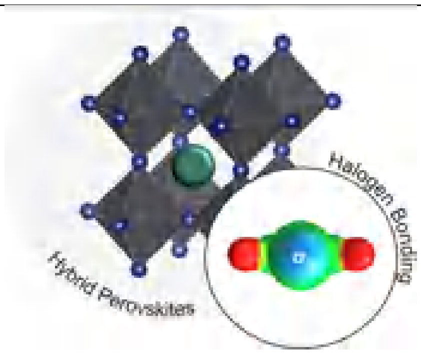
Table 5. Catalysis, Photovoltaics, and Thermoelectrics



Li, X.; Liu, Y.; Zhang, J.-J.; Yan, B.; Jin, C.; Dou, J.; Li, M.; Feng, X.; Liu, G. "No Annealing Synthesis of Ordered Intermetallic PdCu Nanocatalysts for Boosting Formic Acid Oxidation" *Chem. Mater.* **2022,** *34,* 1385-1391.

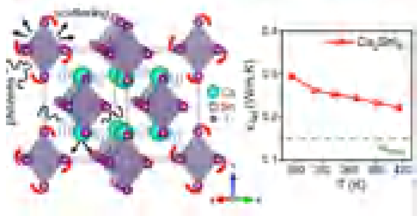


Perspective. Rao, K. K.; Lai, Y.; Zhou, L.; Haber, J. A.; Bajdich, M.; Gregoire, J. M. "Overcoming Hurdles in Oxygen Evolution Catalyst Discovery via Codesign" *Chem. Mater.* **2022,** *34,* 899-910.



Perspective. Ball, M. L.; Milić, J. V.; Loo, Y.-L. "The Emerging Role of Halogen Bonding in Hybrid Perovskite Photovoltaics" *Chem. Mater.* **2022,** *34,* 2495-2502.

Methods/Protocols. Awais, M.; Gangadharan, D. T.; Tan, F.; Saidaminov, M. I. "How to Make 20% Efficient Perovskite Solar Cells in Ambient Air and Encapsulate Them for 500 h of Operational Stability" *Chem. Mater.* **2022,** *34,* 8112-8118.



Bhui, A.; Ghosh, T.; Pal, K.; Rana, K. S.; Kundu, K.; Soni, Ajay, Biswas, K. "Intrinsically Low Thermal Conductivity in the n-Type Vacancy-Ordered Double Perovskite Cs_2SnI_6: Octahedral Rotation and Anharmonic Rattling" *Chem. Mater.* **2022,** *34,* 3301-3310.

https://doi.org/10.1021/acs.chemmater.2c03747
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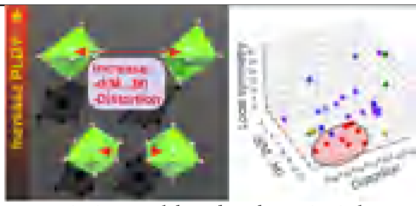
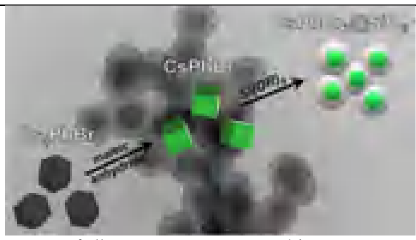
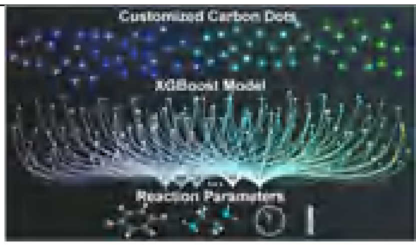
Table 6. Luminescent and Optical Materials



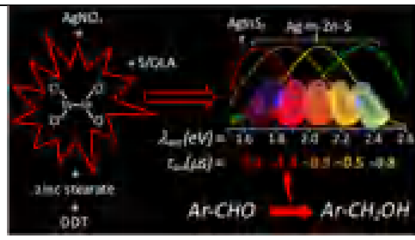
Molokeev, M. S.; Su, B.; Aleksandrovsky, A. S.; Golovnev, N. N.; Plyaskin, M. E.; Xia, Z. "Machine Learning Analysis and Discovery of Zero-Dimensional ns^2 Metal Halides toward Enhanced Photoluminescence Quantum Yield" *Chem. Mater.* **2022,** *34,* 537-546.



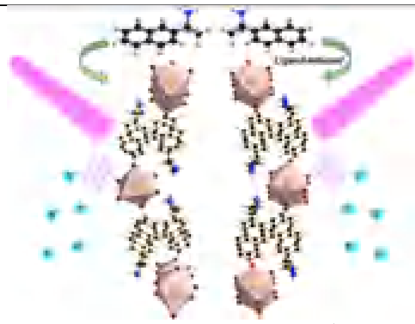
Rossi, C.; Scarfiello, R.; Brescia, R.; Goldoni, L.; Caputo, G.; Carbone, L.; Colombara, D.; Trizio, L. D.; Manna, L.; Baranov, D. "Exploiting the Transformative Features of Metal Halides for the Synthesis of $CsPbBr_3@SiO_2$ Core-Shell Nanocrystals" *Chem. Mater.* **2022,** *34,* 405-413.



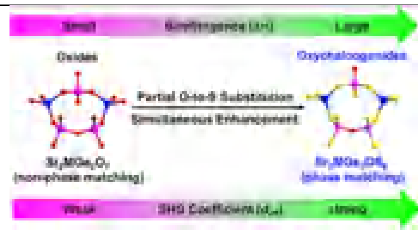
Hong, Q.; Wang, X.-Y.; Gao, Y.-T.; Lv, J.; Chen, B.-B.; Li, D.-W.; Qian, R.-C. "Customized Carbon Dots with Predictable Optical Properties Synthesized at Room Temperature Guided by Machine Learning" *Chem. Mater.* **2022,** *34,* 998-1009.



Kowalik, P.; Bujak, P.; Penkala, M.; Maroń, A. M.; Ostrowski, A.; Kmita, A.; Gajewska, M.; Lisowski, W.; Sobczak, J. W.; Pron, A. "Indium(II) Chloride as a Precursor in the Synthesis of Ternary (Ag-In-S) and Quaternary (Ag-In-Zn-S) Nanocrystals" *Chem. Mater.* **2022,** *34,* 809-825.

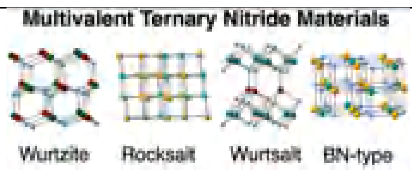


Li, M.; Fang, F.; Huang, X.; Liu, G.; Lai, Z.; Chen, Z.; Hong, J.; Chen, Y.; Wei, R.-j.; Ning, G.-H.; Leng, K.; Shi, Y.; Tian, B. "Chiral Ligand-Induced Structural Transformation of Low-Dimensional Hybrid Perovskite for Circularly Polarized Photodetection" *Chem. Mater.* **2022,** *34,* 2955-2962.

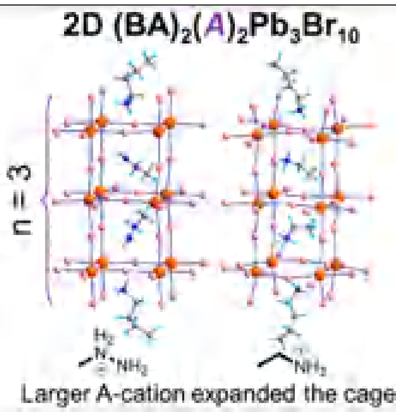


Ran, M.-Y.; Zhou, S.-H.; Li, B.; Wei, W.; Wu, X.-T.; Lin, H.; Zhu, Q.-L. "Enhanced Second-Harmonic-Generation Efficiency and Birefringence in Melillite Oxychalcogenides $Sr_2MGe_2OS_6$ (M = Mn, Zn, and Cd)" *Chem. Mater.* **2022,** *34,* 3853-3861.

Table 7. Materials Discovery



Zakutayev, A.; Bauers, S. R.; Lany, S. "Experimental Synthesis of Theoretically Predicted Multivalent Ternary Nitride Materials" *Chem. Mater.* **2022,** *34,* 1418-1438.



and others in the list is the continued interest in data science and machine learning, moving the community in a more efficient manner toward materials by design.

We hope that you enjoy exploring this list of manuscripts in *Chemistry of Materials* and look forward to celebrating the journal's 35th year!

Sara E. Skrabalak, Editor-in-Chief orcid.org/0000-0002-1873-100X

AUTHOR INFORMATION

Complete contact information is available at: https://pubs.acs.org/10.1021/acs.chemmater.2c03747

Notes

Views expressed in this editorial are those of the author and not necessarily the views of the ACS.

RELATED READINGS

(1) Cheetham, A. K.; Grey, C. P.; Rao, C. N. R. Preface for the Special Issue of *Chemistry of Materials* in Honor of Professor John B. Goodenough on His 100th Birthday. *Chem. Mater.* **2022**, *34*, 6185−6187.

(2) Skrabalak, S. E. Honoring the Past, Embracing the Present, and Inspiring the Future of Materials-Based Research. *Chem. Mater.* **2020**, *32*, 9477−9478.

(3) Xin, F.; Goel, A.; Chen, X.; Zhou, H.; Bai, J.; Liu, S.; Wang, F.; Zhou, G.; Whittingham, M. S. Electrochemical Characterization and Microstructure Evolution of Ni-Rich Layered Cathode Materials by Niobium Coating/Substitution. *Chem. Mater.* **2022**, *34*, 7858−7866.

(4) Chung, H.; Li, Y.; Zhang, M.; Grenier, A.; Mejia, C.; Cheng, D.; Sayahpour, B.; Song, C.; Shen, M. H.; Huang, R.; Wu, E. A.; Chapman, K. W.; Kim, S. J.; Meng, Y. S. Mitigating Anisotropic Changes in Classical Layered Oxide Materials by Controlled Twin Boundary Defects for Long Cycle Life Li-Ion Batteries. *Chem. Mater.* **2022**, *34*, 7302−7312.

(5) Rakov, D.; Hasanpoor, M.; Baskin, A.; Lawson, J. W.; Chen, F.; Cherepanov, P. V.; Simonov, A. N.; Howlett, P. C.; Forsyth, M. Understanding the Effects of Electrolyte Composition and Electrode Preconditioning. *Chem. Mater.* **2022**, *34*, 165−177.

(6) Song, T.; Chen, L.; Gastol, D.; Dong, B.; Marco, J. F.; Berry, F.; Slater, P.; Reed, D.; Kendrick, E. High-Voltage Stabilization of O3-Type Layered Oxide for Sodium-Ion Batteries by Simultaneous Tin Dual Modification. *Chem. Mater.* **2022**, *34*, 4153−4165.

(7) Thangadurai, V.; Chen, B. Solid Li- and Na-Ion Electrolytes for Next Generation Rechargeable Batteries. *Chem. Mater.* **2022**, *34*, 6637−6658.

(8) Guo, H.; Wang, Q.; Urban, A.; Artrith, N. Artificial Intelligence-Aided Mapping of the Structure-Composition-Conductivity Relationships of Glass-Ceramic Lithium Thiophosphate Electrolytes. *Chem. Mater.* **2022**, *34*, 6702−6712.

(9) Lin, Y.; Chen, Y.; Yu, Z.; Huang, Z.; Lai, J.-C.; Tok, J. B.-H.; Cui, Y.; Bao, Z. Reprocessable and Recyclable Polymer Network Electrolytes via Incorporation of Dynamic Covalent Bonds. *Chem. Mater.* **2022**, *34*, 2393−2399.

(10) Park, S.; Chotard, J.-N.; Carlier, D.; Moog, I.; Duttine, M.; Fauth, F.; Iadecola, A.; Croguennec, L.; Masquelier, C. An Asymmetric Sodium Extraction/Insertion Mechanism for the Fe/V-Mixed Nasicon $Na_4FeV(PO_4)_3$. *Chem. Mater.* **2022**, *34*, 4142−4152.

(11) Shimada, T.; Takenaka, N.; Ando, Y.; Otani, M.; Okubo, M.; Yamada, A. Relationship between Electric Double-Layer Structure of MXene Electrode and Its Surface Functional Groups. *Chem. Mater.* **2022**, *34*, 2069−2075.

(12) Natu, V.; Pai, R.; Wilson, O.; Gadasu, E.; Badr, H.; Karmakar, A.; Magenau, A. J. D.; Kalra, V.; Barsoum, M. W. Effect of Base/Nucleophile Treatment on Interlayer Ion Intercalation Surface Terminations, and Osmotic Swelling of $Ti_3C_2T_z$ Mxene Multilayers. *Chem. Mater.* **2022**, *34*, 678−693.

(13) Matthews, K.; Zhang, T.; Shuck, C. E.; VahidMohammadi, A.; Gogotsi, Y. Guidelines for Synthesis and Processing of Chemically Stable Two-Dimensional V_2CT_xMXene. *Chem. Mater.* **2022**, *34*, 499−509.

(14) Zhou, J.; Tao, Q.; Ahmed, B.; Palisaitis, J.; Persson, I.; Halim, J.; Barsoum, M. W.; Persson, P. O. A.; Rosen, J. High-Entropy Laminate Metal Carbide (MAX Phase) and Its Two-Dimensional Derivative Mxene. *Chem. Mater.* **2022**, *34*, 2098−2106.

(15) Mattinen, M.; Gity, F.; Coleman, E.; Vonk, J. F. A.; Verheijen, M. A.; Duffy, R.; Kessels, W. M. M.; Bol, A. A. Atomic Layer Deposition of Large-Area Polycrystalline Transition Metal Dichalcogenides from 100 °C through Control of Plasma Chemistry. *Chem. Mater.* **2022**, *34*, 7280−7292.

(16) Song, Y.; Li, A.; Li, P.; He, L.; Xu, D.; Wu, F.; Zhai, F.; Wu, Y.; Hu, K.; Wang, S.; Sheridan, M. Unassisted Uranyl Photoreduction and Separation in a Donor-Acceptor Covalent Organic Framework. *Chem. Mater.* **2022**, *34*, 2771−2778.

(17) Sun, N.; Jin, Y.; Wang, H.; Yu, B.; Wang, R.; Wu, H.; Zhou, W.; Jiang, J. Photoresponsive Covalent Organic Frameworks with Diarylethene Switch for Tunable Singlet Oxygen Generation. *Chem. Mater.* **2022**, *34*, 1956−1964.

(18) Maschita, J.; Banerjee, T.; Lotsch, B. V. Direct and Linker-Exchange Alcohol-Assisted Hydrothermal Synthesis of Imide-Linked Covalent Organic Frameworks. *Chem. Mater.* **2022**, *34*, 2249−2258.

(19) Ni, X.; Huang, H.; Brédas, J.-L. Emergence of a Two-Dimensional Topological Dirac Semimetal Phase in a Phthalocyanine-Based Covalent Organic Framework. *Chem. Mater.* **2022**, *34*, 3178−3184.

(20) García-Ben, J.; López-Beceiro, J.; Artiaga, R.; Salgado-Beceiro, J.; Delgado-Ferreiro, I.; Kolen'ko, Y. V.; Castro-García, S.; Señarís-Rodríguez, M. A.; Sánchez-Andújar, M.; Bermúdez-García, J. M. Discovery of Colossal Breathing-Caloric Effect under Low Applied Pressure in the Hybrid Organic-Inorganic MIL-53(AI) Material. *Chem. Mater.* **2022**, *34*, 3323−3332.

(21) Wang, Y.; Fan, Z.; Qian, P.; Ala-Nissila, T.; Caro, M. A. Structure and Pore Size Distribution in Nanoporous Carbon. *Chem. Mater.* **2022**, *34*, 617−628.

(22) Yuan, M.; Cao, B.; Liu, H.; Meng, C.; Wu, J.; Zhang, S.; Li, A.; Chen, X.; Song, H. Sodium Storage Mechanism of Nongraphitic Carbons: A General Model and the Function of Accessible Closed Pores. *Chem. Mater.* **2022**, *34*, 3489−3500.

(23) Zhang, X.; Cui, C.; Chen, S.; Meng, L.; Zhao, H.; Xu, F.; Yang, J. Adhesive Ionohydrogels Based on Ionic Liquid/Water Binary Solvents with Freezing Tolerance for Flexible Ionotronic Devices. *Chem. Mater.* **2022**, *34*, 1065−1077.

(24) Guo, H.; Huang, S.; Xu, A.; Xue, W. Injectable Adhesive Self-Healing Multiple-Dynamic-Bond Crosslinked Hydrogel with Photothermal Antibacterial Activity for Infected Wound Healing. *Chem. Mater.* **2022**, *34*, 2655−2671.

(25) Li, X.; Liu, Y.; Zhang, J.-J.; Yan, B.; Jin, C.; Dou, J.; Li, M.; Feng, X.; Liu, G. No Annealing Synthesis of Ordered Intermetallic PdCu Nanocatalysts for Boosting Formic Acid Oxidation. *Chem. Mater.* **2022**, *34*, 1385−1391.

(26) Rao, K. K.; Lai, Y.; Zhou, L.; Haber, J. A.; Bajdich, M.; Gregoire, J. M. Overcoming Hurdles in Oxygen Evolution Catalyst Discovery via Codesign. *Chem. Mater.* **2022**, *34*, 899−910.

(27) Ball, M. L.; Milić, J. V.; Loo, Y.-L. The Emerging Role of Halogen Bonding in Hybrid Perovskite Photovoltaics. *Chem. Mater.* **2022**, *34*, 2495−2502.

(28) Awais, M.; Gangadharan, D. T.; Tan, F.; Saidaminov, M. I. How to Make 20% Efficient Perovskite Solar Cells in Ambient Air and Encapsulate Them for 500 h of Operational Stability. *Chem. Mater.* **2022**, *34*, 8112−8118.

(29) Bhui, A.; Ghosh, T.; Pal, K.; Rana, K. S.; Kundu, K.; Soni, A.; Biswas, K. Intrinsically Low Thermal Conductivity in the n-Type Vacancy-Ordered Double Perovskite Cs_2SnI_6: Octahedral Rotation and Anharmonic Rattling. *Chem. Mater.* **2022**, *34*, 3301−3310.

(30) Molokeev, M. S.; Su, B.; Aleksandrovsky, A. S.; Golovnev, N. N.; Plyaskin, M. E.; Xia, Z. Machine Learning Analysis and Discovery of

Zero-Dimensional ns^2 Metal Halides toward Enhanced Photoluminescence Quantum Yield. *Chem. Mater.* **2022**, *34*, 537−546.
(31) Rossi, C.; Scarfiello, R.; Brescia, R.; Goldoni, L.; Caputo, G.; Carbone, L.; Colombara, D.; De Trizio, L.; Manna, L.; Baranov, D. Exploiting the Transformative Features of Metal Halides for the Synthesis of $CsPbBr_3$@SiO_2 Core-Shell Nanocrystals. *Chem. Mater.* **2022**, *34*, 405−413.
(32) Hong, Q.; Wang, X.-Y.; Gao, Y.-T.; Lv, J.; Chen, B.-B.; Li, D.-W.; Qian, R.-C. Customized Carbon Dots with Predictable Optical Properties Synthesized at Room Temperature Guided by Machine Learning. *Chem. Mater.* **2022**, *34*, 998−1009.
(33) Kowalik, P.; Bujak, P.; Penkala, M.; Maroń, A. M.; Ostrowski, A.; Kmita, A.; Gajewska, M.; Lisowski, W.; Sobczak, J. W.; Pron, A. Indium(II) Chloride as a Precursor in the Synthesis of Ternary (Ag-In-S) and Quaternary (Ag-In-Zn-S) Nanocrystals. *Chem. Mater.* **2022**, *34*, 809−825.
(34) Li, M.; Fang, F.; Huang, X.; Liu, G.; Lai, Z.; Chen, Z.; Hong, J.; Chen, Y.; Wei, R.-j.; Ning, G.-H.; Leng, K.; Shi, Y.; Tian, B. Chiral Ligand-Induced Structural Transformation of Low-Dimensional Hybrid Perovskite for Circularly Polarized Photodetection. *Chem. Mater.* **2022**, *34*, 2955−2962.
(35) Ran, M.-Y.; Zhou, S.-H.; Li, B.; Wei, W.; Wu, X.-T.; Lin, H.; Zhu, Q.-L. Enhanced Second-Harmonic-Generation Efficiency and Birefringence in Melillite Oxychalcogenides $Sr_2MGe_2OS_6$ (M = Mn, Zn, and Cd). *Chem. Mater.* **2022**, *34*, 3853−3861.
(36) Zakutayev, A.; Bauers, S. R.; Lany, S. Experimental Synthesis of Theoretically Predicted Multivalent Ternary Nitride Materials. *Chem. Mater.* **2022**, *34*, 1418−1438.
(37) Li, X.; Cuthriell, S.; Bergonzoni, A.; Dong, H.; Traoré, B.; Stoumpos, C. C.; Guo, P.; Even, J.; Katan, C.; Schaller, R. D.; Kanatzidis, M. G. Expanding the Cage of 2D Bromide Perovskites by Large A-Site Cations. *Chem. Mater.* **2022**, *34*, 1132−1142.
(38) Doeff, M. M.; Clément, R.; Canepa, P. Solid Electrolytes in the Spotlight. *Chem. Mater.* **2022**, *34*, 463−467.
(39) Toro, C.; Skrabalak, S. E. Highlighting Recent Research from Latin America in *Chemistry of Materials*. *Chem. Mater.* **2022**, *34*, 10209−10210.
(40) Gomez, G. E.; Soler-Illia, G. J. A. A. Virtual Issue on Multifunctional Nanoporous Materials in Latin America. *Chem. Mater.* **2021**, *33*, 7569−7571.
(41) Yang, D. Recent Advances in Hydrogels. *Chem. Mater.* **2022**, *34*, 1987−1989.
(42) Li, M.; Liang, Y.; He, J.; Zhang, H.; Guo, B. Two-Pronged Strategy of Biochemically Active and Biochemically Multifunctional Hydrogel Wound Dressing to Accelerate Wound Closure and Wound Healing. *Chem. Mater.* **2020**, *32*, 9937−9953.

https://doi.org/10.1021/acs.chemmater.2c03747
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