

COLLABORATORY FOR A REGENERATIVE ECONOMY

The Story of CoRE: Cleaning Up Clean Energy

*Toxic Use Reduction Spring Conference, April
8th 2026*





Renewable energy is essential

- Reduces emissions driving climate change
- Improves the health of billions of people worldwide
- Creates more jobs than the fossil fuel sector

Given the renewable industry's long production cycles and lifecycles, we have a once-in-a-generation opportunity to ensure clean energy is non-toxic.



What we stand for

Design for Material Safety and Environmental Integrity

We apply benign-by-design strategies to eliminate hazards before materials enter production.

Accelerate Safer Substitutions

Our AI-driven models identify functional, less toxic alternatives faster than legacy methods.

Engage Communities, Advocates and Market leaders

From toxicologists to frontline communities to investors, we co-create solutions that are equitable and durable.

Enable Safer Supply Chain Transitions

We provide actionable insights to replace high-risk materials at critical stages of production.

Build Foundations for Circular Lifecycle Innovation

By redesigning material inputs, we enable regenerative pathways for downstream use and reuse.



Molecules *to* neighborhoods

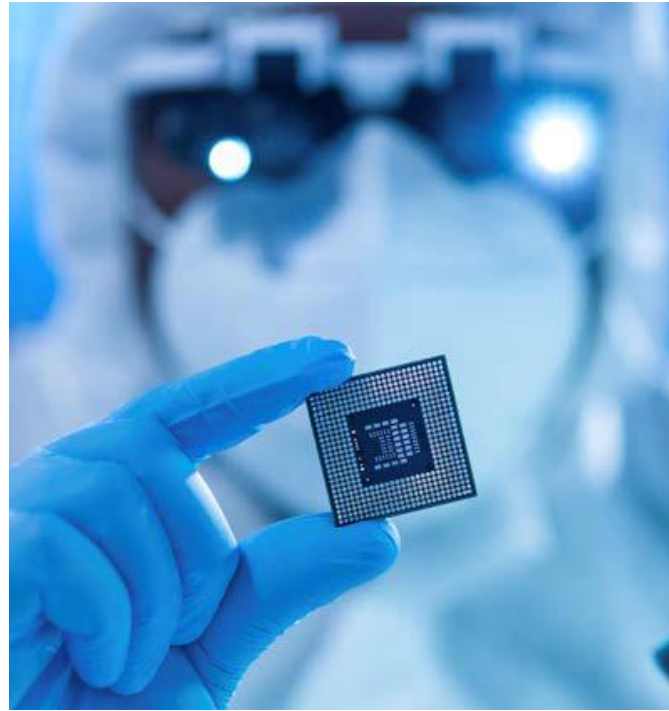
Targeting High-Impact Renewable Energy Sectors
for Circular Innovation

Targeting High-Impact Sectors for Circular Innovation



Batteries

- Alternatives to lithium and PFAS
- Improve performance of sodium technology
- Safer solvents



Semiconductors

- Minimize impact of PFAS in manufacturing gases



Solar panels

- Identify lead-free perovskite alternatives
- Safer solvents

CoRE: Balancing performance and sustainability



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Performance Goal:
Maximize performance
and functionality.



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Sustainability Goal:
Minimize health, environmental,
and social costs.



The current way

Continued reliance on toxic chemicals in clean energy

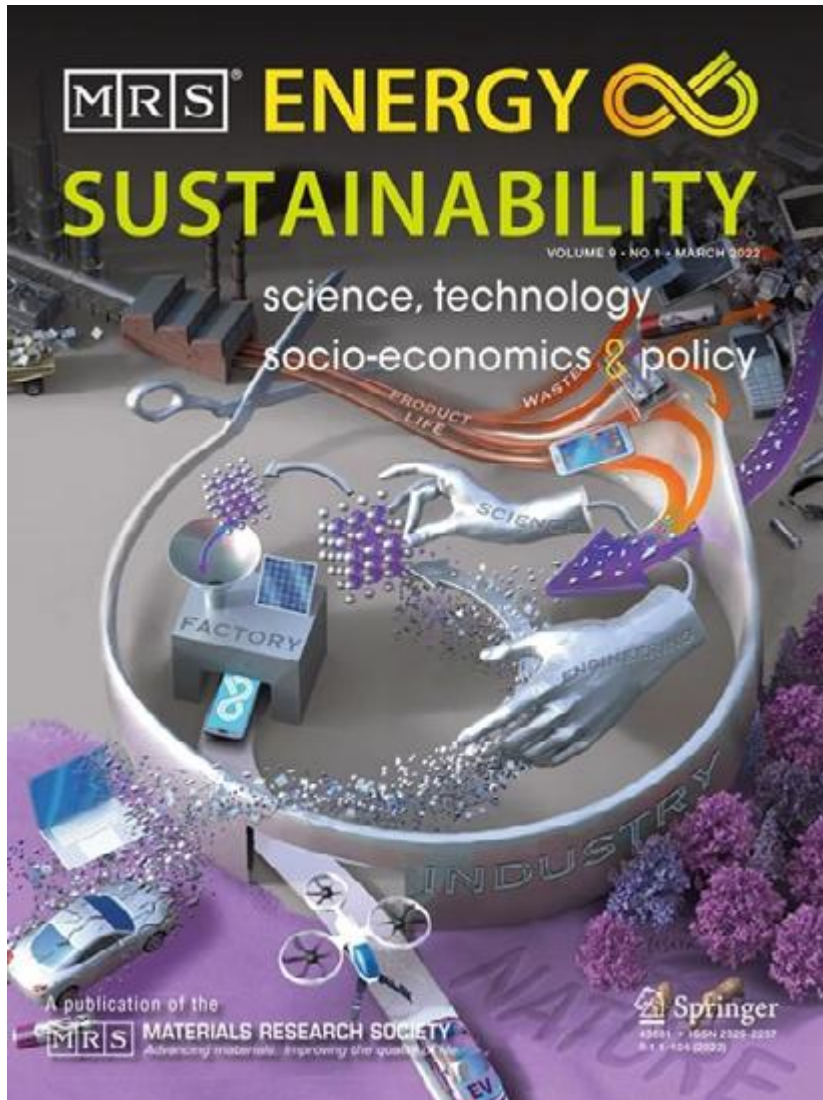
Society has accepted toxic chemicals in clean energy, then attempted to mitigate adverse impacts after the fact.

The CoRE way



Designing out harmful chemicals and pollution at the front end

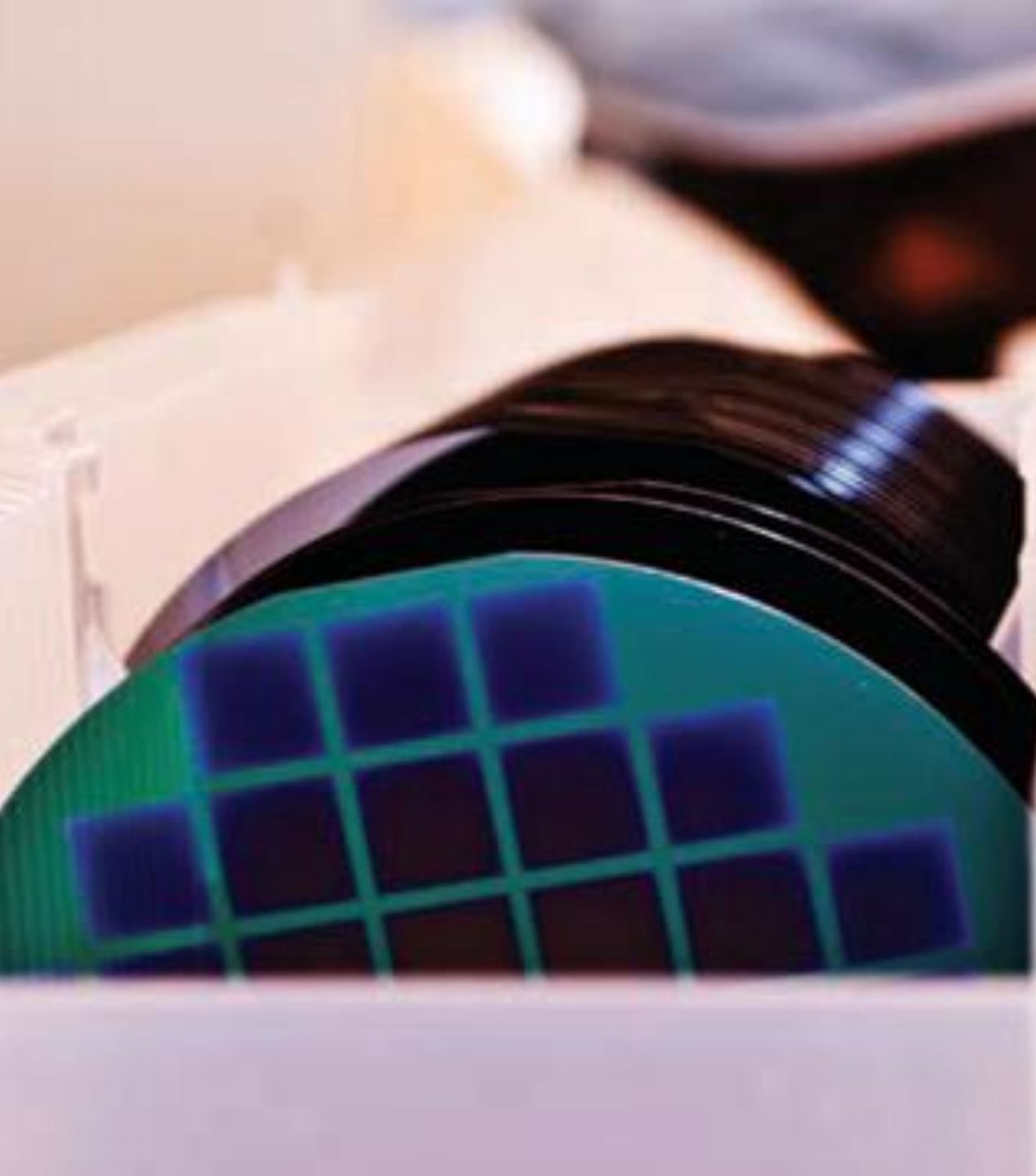
Keeping hazards and pollution out from the beginning through proactive “benign-by-design”



“...the availability of safer materials for many applications is not at scale to meet market demand,” as we wrote in our paper co-authored with Apple.

Benign by design: addressing health and the environment from the start

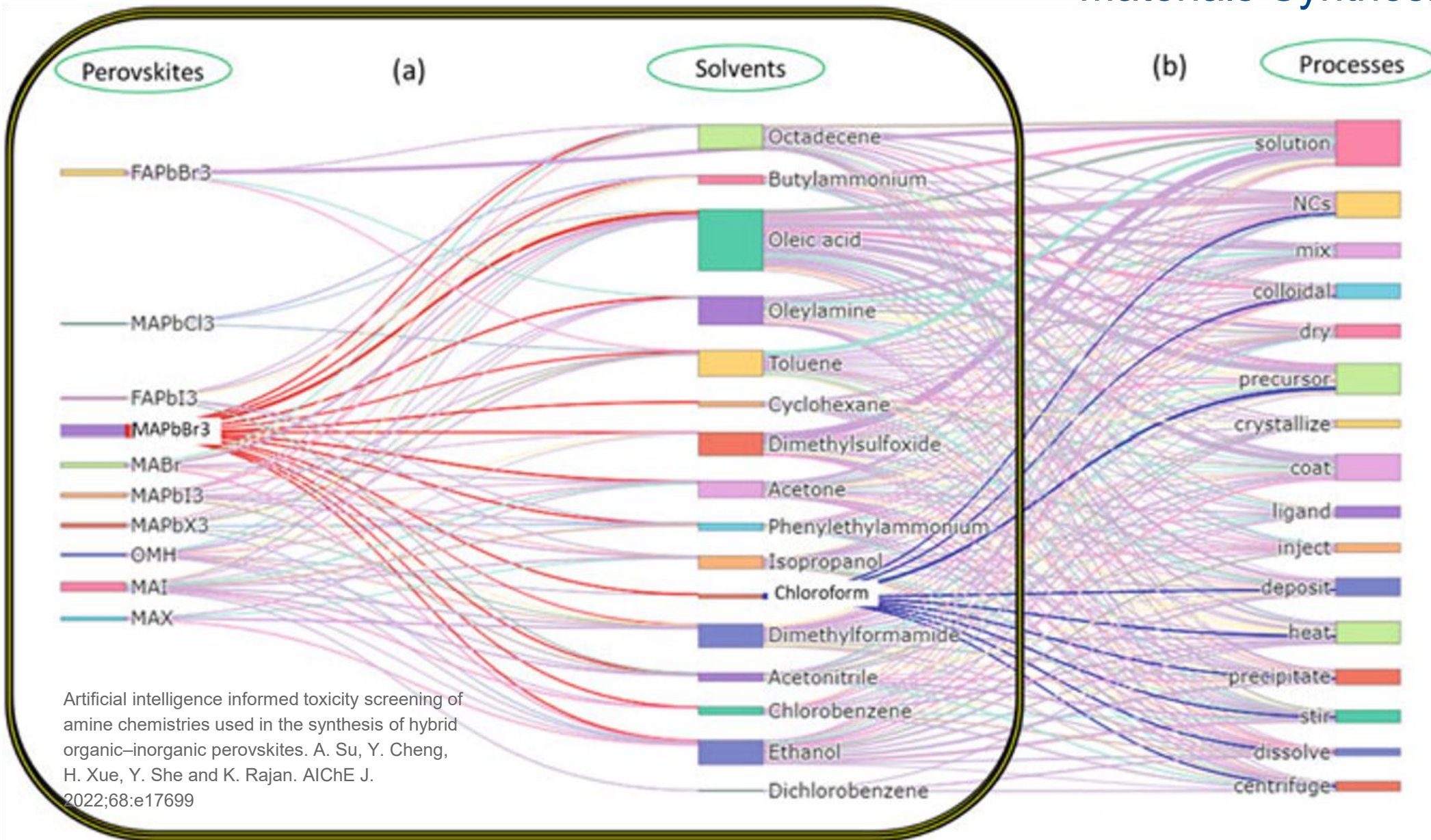
- Safer for people and the environment across the entire product life cycle
- Built on earth-abundant resources
- High performance at competitive costs



Case Study: Using AI to
find safer solvents for
perovskite solar cells

Solar

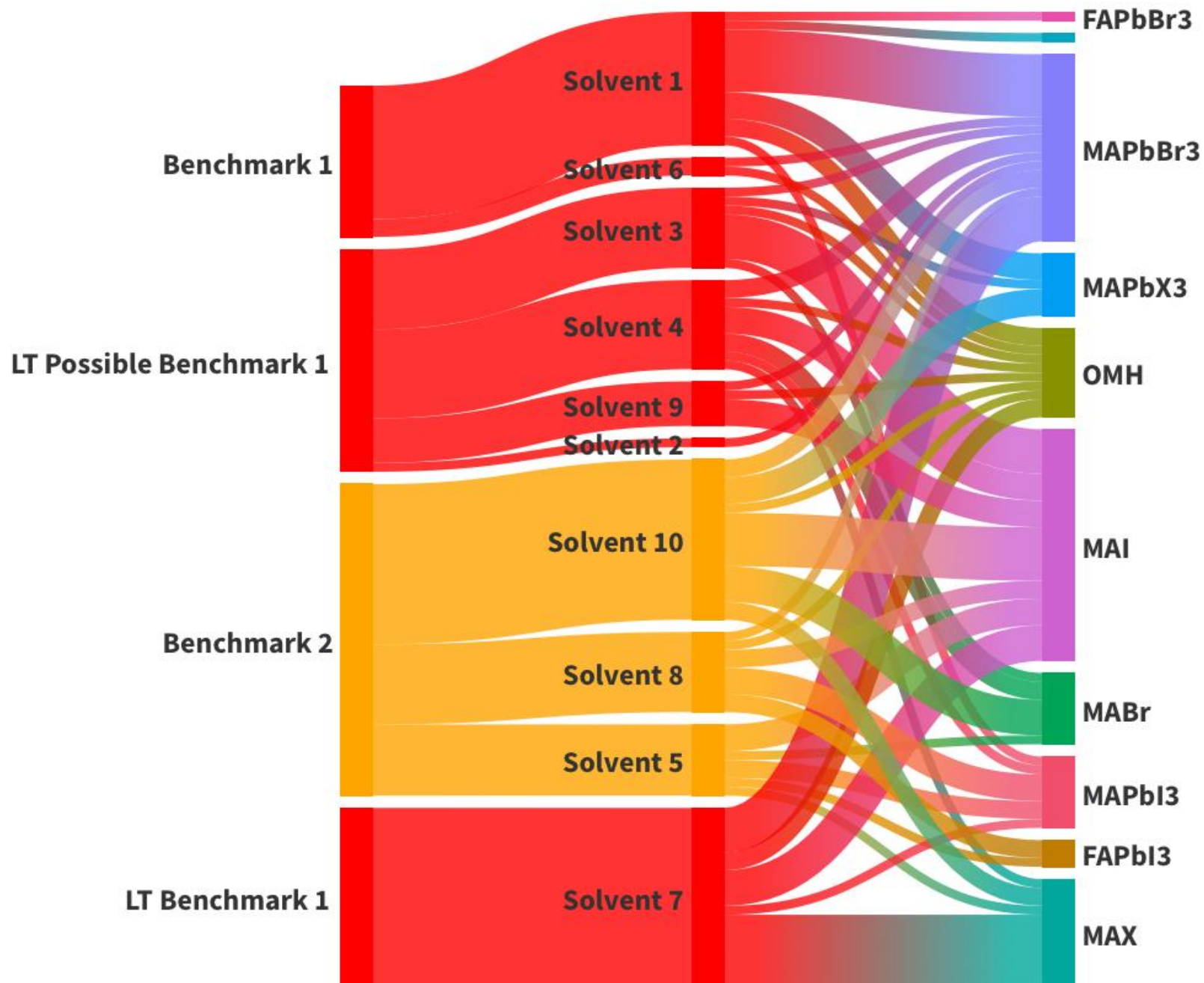
AI to trace Chemicals for Materials Synthesis



Artificial intelligence informed toxicity screening of amine chemistries used in the synthesis of hybrid organic–inorganic perovskites. A. Su, Y. Cheng, H. Xue, Y. She and K. Rajan. *AIChE J.* 2022;68:e17699

Applying GreenScreen benchmarks to solvents

Prioritizing safer substitutions for hazardous solvents in solar manufacturing



Case Study: Using AI to
find safer alternatives to
PFAS use in EV batteries

Batteries

Over 40% of polyvinylidene difluoride (PVDF) manufactured globally goes into EV batteries—and global PVDF production is expected to double by 2028.

Batteries

Safer Solutions to PFAS in Batteries

1. Start with a problematic chemical (e.g., PVDF) and determine its negative impact on human health and the environment



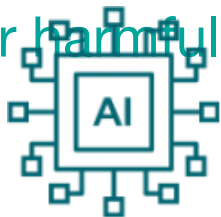
2. Map how the PFAS is used in manufacturing EV batteries



3. Catalog the useful molecular properties of the PFAS (strength, stability, etc.)



4. Map other chemicals that share molecular-scale characteristics of the targeted chemical, but with the potential for fewer harmful impacts



5. Create a shortlist of potential safer substitutes; validate with GreenScreen and lab experiments



6. Conduct real-world tests to prove these PFAS substitutes work well and cause less harm



How CoRE accelerates and improves sustainable material discovery

1. Gather diverse data

Receive data from any third party

- *Sources:* industry, nonprofit, government
- *Types:* material properties, toxicity, health outcomes

Extract / curate data from scientific publications, medical journals, and other datasets using proprietary LLM methodology



2. Apply proprietary AI & ML models

- Analyze dense and sparse data (unlabeled, multi-modal, heterogenous)
- Interpret results based on data context
- Significantly faster vs. previous methods



3. Obtain more accurate and useful predictions

- Reduced risks for humans and the environment
- “Benign-by-design” approach
- Balances performance vs. sustainability
- Results used to further improve models

Proven: CoRE's AI models and tools save years of R&D

CoRE achievement

Impact

Near-instant screening, with property predictions in <1 second per material



Faster material discovery time, streamlined R&D workflows

Accelerated solvent and chemical screening processes by 70%



Expedited commercialization of safer energy tech

5x speed improvement over graph-based AI methods



Maintain accuracy while shortening timelines

Reduced AI model training time by 50%



Less time needed to train AI models for specific applications.

50x faster chemical screening speed vs. laboratory-based approaches



Significantly faster innovation cycles

Our goal: 50% by 2030

CoRE's goal is to identify viable pathways to reduce the chemical footprint of the renewable energy economy and its supply chains globally by at least 50% by 2030.

Achieving this goal would represent significant progress toward 2030 targets set in the United Nations Global Framework on Chemicals

.....University at Buffalo

The University at Buffalo is New York’s flagship and an esteemed member of the Association of American Universities. UB is ranked third in the U.S. for innovation and first in New York State.



Our Team

.....Clean Production Action.....

Clean Production Action is a mission driven non-profit organization that designs and delivers strategic solutions for green chemicals, sustainable materials, and environmentally preferable products.



Our Team

CORE

COLLABORATORY FOR A REGENERATIVE
ECONOMY

Let's make a difference, together

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