

Frontiers in Polymer Science: Advances in Macromolecular Design, Processing, AI/ML, and Applications

Invited contributions are welcome in the following areas:

- Advanced polymerization, catalyst design, reaction mechanisms, controlled polymerization, molecular architecture, functionalization, and precision synthesis of polymers with tailored structures and properties.
- Chain dynamics, molecular interactions, phase behavior, crystallization, glass transition, self-assembly, morphology, and multiscale structure–property relationships in polymeric systems.
- Biocompatible and biodegradable polymers engineered for tissue scaffolds, drug delivery, healthcare, and medical devices.
- Functional polymers for organic electronics, energy storage, sensing, and smart stimuli-responsive systems.
- Sustainable polymer solutions including water purification membranes, carbon capture, and eco-friendly microplastic alternatives.
- Trends on additive manufacturing of polymers and composites, resins formulation and applications.
- Flow behavior, melt rheology, and processing optimization for extrusion, injection molding, and complex fluids.
- Nanocomposites and hybrid polymeric materials to enhance thermal, mechanical, and barrier properties.
- Bio-based polymers for active food packaging, nutrient encapsulation, and structural food matrices.
- Multiscale molecular dynamics simulations and kinetic modeling to predict polymer structure-property relationships.
- Data-driven discovery, machine learning models for property prediction, and AI-optimized material synthesis.

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