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Novel Azopolymers

Easily synthesized electrochromic polymers cut cost for smart windows and adaptive lenses.

Researchers at Purdue University have developed novel azopolymers for electrochromic applications. These azopolymers might be intrinsically suitable as n-type materials due to the N=N pi* LUMO level being low-lying, which would offer new choices in device design. Additionally, these azoploymers are relatively less expensive than comparable materials. Applications may be electrochromic devices such as transition lenses and smart windows.

Advantages:

-Low-Cost

-High-Yield

-Efficient Synthesis

Potential Applications:

-Electrochromic Materials

-Transition Lenses

-Smart Windows

Technology Validation:

The chemical structure of the new azopolymers developed by Purdue researchers have been validated by x-ray crystallography and the percent yield for each of 13 unique polymers has been tested using proton and carbon nuclear magnetic resonance. In addition, cyclic voltammetry has been used to characterize the electroactivity of the new azopolymers.

Recent Publications:

Technology ID

2021-UYED-69342

Category

Chemicals & Advanced Materials/Specialty & Performance Chemicals
Chemicals & Advanced Materials/Polymer Science & Smart Materials
Chemicals & Advanced Materials/Materials Processing & Manufacturing Technologies

Further information

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View online

"Catalytic azoarene synthesis from aryl azides enabled by a dinuclear Ni complex"

Journal of the American Chemical Society

DOI: 10.1021/jacs.8b00503

"Catalytic Synthesis of Conjugated Azopolymers from Aromatic Diazides"

Journal of the American Chemical Society

DOI: 10.1021/jacs.1c00447

Co-Innovator Biography:

Dr. Jianguo Mei is an Associate Professor of Organic Chemistry at Purdue University. Dr. Mei earned a PhD from the University of Florida in 2010 and completed a Postdoctoral Fellowship at Stanford University in 2014. Dr. Mei earned the NSF Career Award in 2017, Teaching for Tomorrow Award in 2017, ACS Division of Organic Chemistry (DOC) Academic Young Investigator award in 2019, and ACS Polymeric Materials: Science and Engineering (PMSE) Young Investigator award in 2020. His research interests include organic and polymer synthesis, device fabrication, and sustainability.

For additional information, please visit Dr. Mei's webpage at ?? or his personal website at https://www.jianguomei.com/about-jianguo.html.

TRL: 4

Intellectual Property:

Provisional-Gov. Funding, 2021-01-19, United States

Utility-Gov. Funding, 2022-01-19, United States

Keywords: Catalyst, Chemical Synthesis, Chemistry and Chemical Analysis, Crosslinking, Electroactive Polymers, Materials and Manufacturing, Nitrogen, Organic Chemistry, Polymers, Processing (Catalyst), Smart Windows

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