

2024

PSK-CAMA 신진연구자 웨비나

2024년 12월 20일(금) AM 10:00 - 11:00 | 온라인 상
<https://kaist.zoom.us/j/83856187608>

주최 한국고분자학회

주관 콜로이드 및 분자조립 부문위원회

○ 초대의 글

'PSK-CAMA 신진연구자 웨비나'는 우수한 연구역량을 가진 신진연구자를 발굴하여 교류의 장을 넓히고자 한국고분자학회 주최로 마련한 온라인 세미나입니다. 이번 세미나에서는 고분자 분야 중에서도 특히 콜로이드 및 자기조립소재를 이용하여 선도연구를 수행하는 신진연구자의 우수한 연구 성과를 공유하는 자리를 마련하였으니 관심있는 분들의 많은 참여 부탁드립니다.

○ 일정

AM 10:00 - 11:00

Dual-Wavelength 3D Printing with Spectral-Controlled Photopolymerizations for Multimaterial Structures

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ABSTRACT: Advancements in light-based 3D printing technologies have revolutionized the rapid fabrication of complex structures with exceptional resolution. This study explores the fabrication of multimaterial 3D structures designed to replicate the intricate organization of hard and soft materials observed in biological systems. Here, we introduce a novel dual-wavelength curable hybrid epoxy-acrylate resin that enables high-speed printing of objects with distinct mechanical properties and seamless integration between rigid and flexible regions. The photosystem's spectral selectivity was thoroughly analyzed using UV-visible and real-time FTIR absorption spectroscopies, capturing photoinitiated radical and cationic polymerization processes at separate wavelengths. Mechanical testing revealed a broad range of Young's moduli, spanning from 0.4 MPa to 1,600 MPa. Demonstrated applications include bioinspired multimaterial structures, such as brick-and-mortar designs for enhanced toughness, hybrid components combining hard springs and soft cylinders to modulate compressive behavior, and knee joint models enabling smooth bending motions. This research underscores the potential of advanced photopolymerization chemistry and spectral control to enable the creation of integrated multimaterial architectures with hard, robust elements seamlessly paired with soft, elastic, and compressible parts.



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