

Dr. Codrin Tugui

Research Scientist

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Research topics

Exploring silicone chemistry to comprehend the fundamentals of dielectric elastomers and to develop new silicone elastomers and silicone-based electrodes. Synthesizing polysiloxanes with various molecular weights and functionalities, as well as designing different crosslinking systems to optimize the mechanical and electrical properties of dielectric elastomers. Adapting different processing methods, such as spin coating, blade coating, or additive manufacturing, to create dielectric elastomers with custom dimensions and high uniformities. Formulating silicone inks suitable for 3D printing and investigating the combination of conductive fillers and silicone inks to create 3D-printed dielectric elastomer actuators. Exploring the 3D printing of dielectric elastomers for soft robotic applications. Adapting silicone chemistry to create dielectric elastomer actuators with tunable properties.

Scientific research

Author and co-author of 39 ISI articles, 2 patent applications, 2 invited talks, member in 11 research national/international grants and Director for 1 national grant (Contract number: PN-III-P1-1.1-PD-2019-0649, Financed by Executive Agency for Higher Education, Research, Development and Innovation (UEFISCDI), Multi-stimuli responsive silicone composites for switchable dual-function transducers, 2020-2022).

Visibility

<https://www.brainmap.ro/codrin-tugui>

SELECTED RELEVANT SCIENTIFIC ARTICLES

1. M. Damoc, V. Tiron, C. Tugui, C.D. Varganici, A.C. Stoica, G. Novitchi, M. Dascalu M. Cazacu, Ferronematic Co(II) Complex: An Active Filler for Magnetically Actuated Soft Materials, *Small*, **2023**; <https://doi.org/10.1002/sml.202307006>
2. C. Tugui, M. Cazacu, D.M. Manoli, A. Stefan, M. Duduta, All-Silicone 3D Printing Technology: Toward Highly Elastic Dielectric Elastomers and Complex Structures, *ACS Applied Polymer Materials*, **2023**; 5(10): 7936; <https://doi.org/10.1021/acsapm.3c01190>
3. C. Racles, C. Ursu, M. Dascalu, M. Asandulesa, V. Tiron, A. Bele, C. Tugui, S.T. Onesim, Multi-stimuli responsive free-standing films of DR1- grafted silicones, *Chemical Engineering Journal*, **2021**; 401: 126087; <https://doi.org/10.1016/j.cej.2020.126087>
4. C. Tugui, G. Stiubianu, M.S. Serbulea, M. Cazacu, Silicone dielectric elastomers optimized by crosslinking pattern—a simple approach to high-performance actuators, *Polymer Chemistry*, **2020**; 11(19): 3271; <https://doi.org/10.1039/D0PY00223B>

5. C. Tugui, V. Tiron, M. Dascalu, L. Sacarescu, M. Cazacu, From ultra-high molecular weight polydimethylsiloxane to super-soft elastomer, *European Polymer Journal*, **2019**; 120: 109243; <https://doi.org/10.1016/j.eurpolymj.2019.109243>
6. C. Tugui, M.S. Serbulea, M. Cazacu, Preparation and characterisation of stacked planar actuators, *Chemical Engineering Journal*, **2019**; 364: 217; <https://doi.org/10.1016/j.cej.2019.01.150>