

Assoc. Prof. EMRE BÜKÜŞOĞLU

Personal Information

Office Phone: [+90 312 210 2628](tel:+903122102628)

Fax Phone: [+90 312 210 2600](tel:+903122102600)

Email: emrebuk@metu.edu.tr

Web: <https://avesis.metu.edu.tr/emrebuk>

International Researcher IDs

ScholarID: zOhLOYAAAAAJ

ORCID: 0000-0002-3128-059X

Publons / Web Of Science ResearcherID: AAZ-8999-2020

ScopusID: 55827457200

Yoksis Researcher ID: 263414

Education Information

Doctorate, University of Wisconsin-Madison, Kimya Mühendisliği Bölümü, United States Of America 2010 - 2015

Postgraduate, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, Turkey
2008 - 2010

Undergraduate, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, Turkey
2003 - 2008

Dissertations

Doctorate, Design of Functional Materials Based on Confined Liquid Crystals, University Of Wisconsin-Madison, Kimya Mühendisliği Bölümü, 2015

Postgraduate, Dehydration of alcohol solutions obtained from a solvent recovery process by pervaporation, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2010

Research Areas

Thermodynamics, Separation Operations, Optical Properties, Interface Chemistry, Polymeric Materials, Thermodynamics, Surface Chemistry

Academic Titles / Tasks

Assistant Professor, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2018
- Continues

Assistant Professor, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2017
- 2018

Academic and Administrative Experience

Deputy Head of Department, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2018 - 2021

Courses

Thermodynamics II, Undergraduate, 2019 - 2020

Interfacial Phenomena, Undergraduate, 2017 - 2018

Advising Theses

BÜKÜŞOĞLU E., Processing cellulose nanocrystal suspensions for aligned deposition, Postgraduate, C.KOCAMAN(Student), 2022

BÜKÜŞOĞLU E., Investigation of active microparticle motion at structured oil-aqueous interfaces and microcargo release via interfacial shear, Postgraduate, R.UMUT(Student), 2022

BÜKÜŞOĞLU E., Controlled synthesis of organic-inorganic composite particles, Postgraduate, E.ERÇELİK(Student), 2022

KALIPÇILAR H., BÜKÜŞOĞLU E., Modification of pebax and zif-8/pebax membranes by additional solvent treatment to improve co₂/n₂ separation performance, Postgraduate, A.Abdulalem(Student), 2020

Büküşoğlu E., SYNTHESIS AND CHARACTERIZATION OF SENSOR MICROPARTICLES TEMPLATED FROM CHOLESTERIC LIQUID CRYSTALS, Postgraduate, D.İŞINSU(Student), 2020

Büküşoğlu E., LIQUID CRYSTAL - TEMPLATED SYNTHESIS OF POLYMERIC MICROPARTICLES WITH COMPLEX NANOSTRUCTURES, Postgraduate, B.AKDENİZ(Student), 2019

Kalıpçılar H., Büküşoğlu E., Design of functional materials using liquid crystals as molecular templates, Postgraduate, A.KARAUSTA(Student), 2018

Jury Memberships

Doctorate, Doctorate, Orta Doğu Teknik Üniversitesi, September, 2018

Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Optically responsive dry cholesteric liquid crystal marbles**
KOCAMAN C., BATIR Ö., BÜKÜŞOĞLU E.
Journal of Colloid and Interface Science, vol.671, pp.374-384, 2024 (SCI-Expanded)
- II. **Cross-Linked Cellulose Nanocrystal Membranes with Cholesteric Assembly**
İÇTEN B. C., BÜKÜŞOĞLU E., ÇULFAZ EMECEN P. Z.
LANGMUIR, 2024 (SCI-Expanded)
- III. **Nanoparticle-Assisted Liquid Crystal Droplet Sensors Enable Analysis of Low-Concentration Species in Aqueous Medium**
SEZER S., BÜKÜŞOĞLU E.
Langmuir, vol.40, no.6, pp.3154-3167, 2024 (SCI-Expanded)
- IV. **Understanding directed assembly of concentrated nanoparticles at energetically heterogeneous interfaces of cholesteric liquid crystal droplets**
AKMAN A., BÜKÜŞOĞLU E.
Journal of Colloid and Interface Science, vol.649, pp.772-784, 2023 (SCI-Expanded)
- V. **Controlled release of microcargo from water-in-liquid crystal emulsions via interfacial shear induced by synthetic microstirrers**
Dinç R. U., Büküşoğlu E.
SOFT MATTER, vol.19, no.23, pp.4304-4314, 2023 (SCI-Expanded)

- VI. **Tuning electrostatic interactions for controlled structure and rejection of cellulose nanocrystal membranes**
KOCAMAN C., BÜKÜŞOĞLU E., ÇULFAZ EMECEN P. Z.
Journal of Membrane Science, vol.661, 2022 (SCI-Expanded)
- VII. **Contactless Pulsed and Continuous Microdroplet Release Using Photothermal Liquid Crystals**
BEYAZKILIÇ AYAS P., Akcimen S., Elbuken C., Ortac B., Cai S., BÜKÜŞOĞLU E.
ADVANCED FUNCTIONAL MATERIALS, vol.32, no.44, 2022 (SCI-Expanded)
- VIII. **Interpenetrating network based polymeric sensors with enhanced specificity, sensitivity, and reusability**
BATIR Ö., BAT E., BÜKÜŞOĞLU E.
Sensors and Actuators B: Chemical, vol.367, 2022 (SCI-Expanded)
- IX. **Liquid crystal microcapillary-based sensors for affordable analytical applications**
Kurt E., Büküşoğlu E.
SOFT MATTER, vol.18, pp.4009-4016, 2022 (SCI-Expanded)
- X. **Nanoparticle adsorption induced configurations of nematic liquid crystal droplets**
Sengul S., AYDOĞAN N., BÜKÜŞOĞLU E.
JOURNAL OF COLLOID AND INTERFACE SCIENCE, vol.608, pp.2310-2320, 2022 (SCI-Expanded)
- XI. **Controlling Ultrafiltration Membrane Rejection via Shear-Aligned Deposition of Cellulose Nanocrystals from Aqueous Suspensions**
Kocaman C., Büküşoğlu E., Çulfaz Emecen P. Z.
ACS APPLIED MATERIALS & INTERFACES, vol.13, no.30, pp.36548-36557, 2021 (SCI-Expanded)
- XII. **Controlling the shapes and internal complexity of the polymeric particles using liquid crystal-templates confined into microwells**
KARAUSTA A., KOCAMAN C., BÜKÜŞOĞLU E.
JOURNAL OF MOLECULAR LIQUIDS, vol.324, 2021 (SCI-Expanded)
- XIII. **Chameleon skin-inspired polymeric particles for the detection of toluene vapor**
Avsar D. I., Büküşoğlu E.
SOFT MATTER, vol.16, pp.8683-8691, 2020 (SCI-Expanded)
- XIV. **Identification and sorting of particle chirality using liquid crystallinity**
Akdeniz B., Batır Ö., Büküşoğlu E.
JOURNAL OF COLLOID AND INTERFACE SCIENCE, vol.574, pp.11-19, 2020 (SCI-Expanded)
- XV. **Strain-enhanced sensitivity of polymeric sensors templated from cholesteric liquid crystals**
Batır Ö., Bat E., Büküşoğlu E.
SOFT MATTER, vol.16, no.29, pp.6794-6802, 2020 (SCI-Expanded)
- XVI. **Prolate and oblate chiral liquid crystal spheroids**
Sadati M., Martinez-Gonzalez J. A., Zhou Y., Qazvini N. T., Kurtenbach K., Li X., Büküşoğlu E., Zhang R., Abbott N. L., Pablo Hernandez-Ortiz J., et al.
SCIENCE ADVANCES, vol.6, no.28, 2020 (SCI-Expanded)
- XVII. **Programming van der Waals interactions with complex symmetries into microparticles using liquid crystallinity**
Fuster H. A., Wang X., Wang X., Bukusoglu E., Spagnolie S. E., Abbott N. L.
SCIENCE ADVANCES, vol.6, no.25, 2020 (SCI-Expanded)
- XVIII. **Addressing challenges in the ultrafiltration of biomolecules from complex aqueous environments**
Büküşoğlu E., Koku H., Çulfaz-Emecen P. Z.
Current Opinion in Colloid and Interface Science, vol.46, pp.52-64, 2020 (SCI-Expanded)
- XIX. **Design Parameters and Principles of Liquid-Crystal-Templated Synthesis of Polymeric Materials via Photolithography**
AKDENİZ B., BÜKÜŞOĞLU E.
LANGMUIR, vol.35, no.40, pp.13126-13134, 2019 (SCI-Expanded)
- XX. **Liquid Crystal Templates Combined with Photolithography Enable Synthesis of Chiral Twisted Polymeric Microparticles**

- AKDENİZ B., BÜKÜŞOĞLU E.
MACROMOLECULAR RAPID COMMUNICATIONS, vol.40, no.15, 2019 (SCI-Expanded)
- XXI. **Liquid Crystal-Templated Synthesis of Mesoporous Membranes with Predetermined Pore Alignment**
Karausta A., Büküşoğlu E.
ACS APPLIED MATERIALS & INTERFACES, vol.10, no.39, pp.33484-33492, 2018 (SCI-Expanded)
- XXII. **Self-reporting and self-regulating liquid crystals**
Kim Y., Wang X., Mondkar P., Bukusoglu E., Abbott N. L.
NATURE, vol.557, no.7706, pp.539-560, 2018 (SCI-Expanded)
- XXIII. **Dehydration of Industrial Byproduct Solutions for Recycling via Pervaporation-Adsorption Hybrid Process**
BÜKÜŞOĞLU E., KALIPÇILAR H., YILMAZ L.
INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH, vol.57, no.6, pp.2277-2286, 2018 (SCI-Expanded)
- XXIV. **Strain-induced alignment and phase behavior of blue phase liquid crystals confined to thin films**
Büküşoğlu E., Martinez-Gonzalez J. A., Wang X., Zhou Y., De Pablo J. J., Abbott N. L.
SOFT MATTER, vol.13, no.47, pp.8999-9006, 2017 (SCI-Expanded)
- XXV. **Active Janus Particles at Interfaces of Liquid Crystals**
Mangal R., Nayani K., Kim Y., Büküşoğlu E., Cordova-Figueroa U. M., Abbott N. L.
LANGMUIR, vol.33, no.41, pp.10917-10926, 2017 (SCI-Expanded)
- XXVI. **Patterned surface anchoring of nematic droplets at miscible liquid-liquid interfaces**
Wang X., Zhou Y., Kim Y., Miller D. S., Zhang R., Martinez-Gonzalez J. A., Büküşoğlu E., Zhang B., Brown T. M., De Pablo J. J., et al.
SOFT MATTER, vol.13, no.34, pp.5714-5723, 2017 (SCI-Expanded)
- XXVII. **A Practical Guide to the Preparation of Liquid Crystal-Templated Microparticles**
Wang X., Büküşoğlu E., Abbott N. L.
CHEMISTRY OF MATERIALS, vol.29, no.1, pp.53-61, 2017 (SCI-Expanded)
- XXVIII. **Synthesis of Optically Complex, Porous, and Anisometric Polymeric Microparticles by Templating from Liquid Crystalline Droplets**
Wang X., Büküşoğlu E., Miller D. S., Pantoja M. A. B., Xiang J., Lavrentovich O. D., Abbott N. L.
ADVANCED FUNCTIONAL MATERIALS, vol.26, no.40, pp.7343-7351, 2016 (SCI-Expanded)
- XXIX. **Structural Transitions in Cholesteric Liquid Crystal Droplets**
Zhou Y., BÜKÜŞOĞLU E., Martinez-Gonzalez J. A., Rahimi M., Roberts T. F., Zhang R., Wang X., Abbott N. L., de Pablo J. J.
ACS NANO, vol.10, no.7, pp.6484-6490, 2016 (SCI-Expanded)
- XXX. **Experimental Insights into the Nanostructure of the Cores of Topological Defects in Liquid Crystals**
Wang X., Kim Y., Büküşoğlu E., Zhang B., Miller D. S., Abbott N. L.
PHYSICAL REVIEW LETTERS, vol.116, no.14, 2016 (SCI-Expanded)
- XXXI. **Positioning colloids at the surfaces of cholesteric liquid crystal droplets**
BÜKÜŞOĞLU E., Wang X., Zhou Y., A. Martinez-Gonzalez J., Rahimi M., Wang Q., de Pablo J. J., Abbott N. L.
SOFT MATTER, vol.12, no.42, pp.8781-8789, 2016 (SCI-Expanded)
- XXXII. **Design of Responsive and Active (Soft) Materials Using Liquid Crystals**
BÜKÜŞOĞLU E., Pantoja M. B., Mushenheim P. C., Wang X., Abbott N. L.
ANNUAL REVIEW OF CHEMICAL AND BIOMOLECULAR ENGINEERING, VOL 7, vol.7, pp.163-196, 2016 (SCI-Expanded)
- XXXIII. **Topological defects in liquid crystals as templates for molecular self-assembly**
Wang X., Miller D. S., Büküşoğlu E., De Pablo J. J., Abbott N. L.
NATURE MATERIALS, vol.15, no.1, pp.106-114, 2016 (SCI-Expanded)
- XXXIV. **Stimuli-Responsive Cubosomes Formed from Blue Phase Liquid Crystals**
BÜKÜŞOĞLU E., Wang X., Martinez-Gonzalez J. A., de Pablo J. J., Abbott N. L.
ADVANCED MATERIALS, vol.27, no.43, pp.6892-6899, 2015 (SCI-Expanded)
- XXXV. **Blue-phase liquid crystal droplets**
Martinez-Gonzalez J. A., Zhou Y., Rahimi M., BÜKÜŞOĞLU E., Abbott N. L., de Pablo J. J.

PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol.112, no.43, pp.13195-13200, 2015 (SCI-Expanded)

XXXVI. Nanoparticle self-assembly at the interface of liquid crystal droplets

Rahimi M., Roberts T. F., Armas-Pérez J. C., Wang X., BÜKÜŞOĞLU E., Abbott N. L., de Pablo J. J.

PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol.112, no.17, pp.5297-5302, 2015 (SCI-Expanded)

XXXVII. Hierarchical Microstructures Formed by Bidisperse Colloidal Suspensions within Colloid-in-Liquid Crystal Gels

Diestra-Cruz H., BÜKÜŞOĞLU E., Abbott N. L., Acevedo A.

ACS APPLIED MATERIALS & INTERFACES, vol.7, no.13, pp.7153-7162, 2015 (SCI-Expanded)

XXXVIII. Colloid-in-liquid crystal gels formed via spinodal decomposition

BÜKÜŞOĞLU E., Pal S. K., de Pablo J. J., Abbott N. L.

SOFT MATTER, vol.10, no.10, pp.1602-1610, 2014 (SCI-Expanded)

XXXIX. Colloid-in-Liquid Crystal Gels that Respond to Biomolecular Interactions

Agarwal A., Sidiq S., Setia S., BÜKÜŞOĞLU E., de Pablo J. J., Pal S. K., Abbott N. L.

SMALL, vol.9, no.16, pp.2785-2792, 2013 (SCI-Expanded)

Articles Published in Other Journals

I. Shape Effects on the Structure and Response of the Polymeric Particles Synthesized from Cholesteric Liquid Crystal Templates

Avşar D. I., BÜKÜŞOĞLU E.

Erciyes Üniversitesi Fen Bilimleri Enstitüsü Dergisi, vol.37, pp.26-35, 2021 (Peer-Reviewed Journal)

II. Positioning of Cubic Shaped Particles with Different Edge Structures in Nematic Medium

KARAUSTA A., BÜKÜŞOĞLU E.

Celal Bayar Üniversitesi Fen Bilimleri Dergisi, vol.17, no.2, pp.115-120, 2021 (Peer-Reviewed Journal)

Refereed Congress / Symposium Publications in Proceedings

I. Nanoparticle adsorption-induced configurations of liquid crystal droplets

Şengül S., BÜKÜŞOĞLU E.

ACS Fall 2021, 22 - 26 August 2021

II. Enhanced sensitivity of polymeric sensors templated from cholesteric liquid crystals

BATIR Ö., BAT E., BÜKÜŞOĞLU E.

ACS Fall 2021, 22 - 26 August 2021

III. Liquid Crystal Self-Assembly: A Route for Anisotropic Composites

Şengül S., BÜKÜŞOĞLU E.

20th International Metallurgy and Materials Congress, 10 - 12 June 2021

IV. Düşük Maliyette Uygulamalara Yönelik Mikrokapiler Sıvı Kristal Sensörler

Kurt E., Büküşoğlu E.

Ulusal Kimya Mühendisliği Kongresi, Konya, Turkey, 10 - 12 June 2021

V. Designing Responsive Polymeric Materials using Liquid Crystallinity

BÜKÜŞOĞLU E., Akdeniz B., Avşar D. I., Karausta A.

Nano TR, Turkey, 3 - 06 November 2019

VI. Liquid Crystal-Templated Synthesis of Complex Microparticles and their Sensor Applications

Akdeniz B., Karausta A., Kocaman C., Avşar D. I., BÜKÜŞOĞLU E.

Gordon Research Conferences on Liquid Crystals, 7 - 12 July 2019

VII. Synthesis of Liquid Crystal Templated Polymeric Microparticles Shaped by Microwells

Kocaman C., Akdeniz B., Büküşoğlu E.

- Eastern Mediterranean Chemical Engineering Conferences 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- VIII. **Liquid Crystal-Templated Synthesis of Anisotropic Ultrafiltration Membranes**
Büküşoğlu E., Karausta A.
Eastern Mediterranean Chemical Engineering Conference 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- IX. **Synthesis and Characterization of Micro Particles Templated from Cholesteric Liquid Crystal for Sensor Application**
Büküşoğlu E., Avşar D. I.
Eastern Mediterranean Chemical Engineering Conference 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- X. **Synthesis of 3D Chiral Microparticles from Nematic Liquid Crystal Templates**
Büküşoğlu E., Akdeniz B.
Eastern Mediterranean Chemical Engineering Conference 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- XI. **Cholesteric Liquid Crystal Based Polymeric Sensors for Detection of Volatile Organic Compounds**
Batır Ö., Bat E., Büküşoğlu E.
Eastern Mediterranean Chemical Engineering Conferences 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- XII. **Liquid Crystal-Templated Synthesis of Polymeric Films and their Potential Use in Chemical Processes**
Karausta A., Büküşoğlu E.
27th International Liquid Crystal Conference, Kyoto, Japan, 22 - 28 July 2018
- XIII. **Synthesis of Optically Complex, Porous and Anisometric Polymeric Materials by Templating from Liquid Crystalline Media**
BÜKÜŞOĞLU E., Wang X., Abbott N. L.
Gordon Research Conferences on Liquid Crystals, 18 June 2017 - 23 June 2016
- XIV. **Triggered Release of Dispersed Microdroplets from Anisotropic Fluids**
Kim Y., Wang X., BÜKÜŞOĞLU E., Mondkar P., Abbott N. L.
APS March Meeting, 13 March 2017

Supported Projects

ÇULFAZ EMECEN P. Z., BÜKÜŞOĞLU E., Project Supported by Higher Education Institutions, Kontrollü koloid birikimi ile membran üretimi: Koloid filtrasyonunun gözlemlenmesi ve koloidler arası etkileşimlerin belirlenmesi, 2022 - Continues
Büküşoğlu E., H2020 Project, Liquid Crystals in Flow: A New Era in Sensing and Diagnostics, 2022 - 2027
Çulfaz Emecen P. Z., Erel Göktepe İ., Büküşoğlu E., Ondaral S., TUBITAK Project, Selüloz Nanokristal Ve Nanofibriller Kullanılarak Katman-Katman Kendiliğinden Yapılanma Yöntemi İle Nanofiltrasyon Membranlarının Geliştirilmesi, 2021 - 2024
ÇULFAZ EMECEN P. Z., İÇTEN B. C., BÜKÜŞOĞLU E., Project Supported by Higher Education Institutions, Selüloz nanokristal membranlar, 2022 - 2023
BÜKÜŞOĞLU E., BAT E., BATIR Ö., Project Supported by Higher Education Institutions, Polimerik Gaz Sensörlerinin Geliştirilmesi, 2020 - 2022

Activities in Scientific Journals

Frontiers in Soft Matter, Committee Member, 2021 - Continues

Scientific Refereeing

ADVANCED MATERIALS, SCI Journal, December 2022
ACS APPLIED POLYMER MATERIALS, SCI Journal, October 2022
SMALL, SCI Journal, July 2022
SOFT MATTER, SCI Journal, May 2022

CURRENT OPINION IN COLLOID AND INTERFACE SCIENCE, SCI Journal, April 2022
ACS APPLIED MATERIALS & INTERFACES, SCI Journal, April 2022
ACS APPLIED MATERIALS & INTERFACES, SCI Journal, December 2020
ACS APPLIED MATERIALS & INTERFACES, SCI Journal, October 2020
ACS OMEGA, SCI Journal, October 2020
TUBITAK Project, 1002 - Quick Support Program, Middle East Technical University, Turkey, June 2020
ACS APPLIED POLYMER MATERIALS, SCI Journal, May 2020
LANGMUIR, SCI Journal, April 2020
TUBITAK Project, 1002 - Quick Support Program, Middle East Technical University, Turkey, January 2020

Metrics

Publication: 56
Citation (WoS): 1037
Citation (Scopus): 1072
H-Index (WoS): 17
H-Index (Scopus): 17

Congress and Symposium Activities

Eastern Mediterranean Chemical Engineering Conferences, Working Group, Ankara, Turkey, 2018
Eastern Mediterranean Chemical Engineering Conferences, Working Group, Ankara, Turkey, 2018
Eastern Mediterranean Chemical Engineering Conferences, Working Group, Ankara, Turkey, 2018
International Liquid Crystals Conference 2018, Working Group, Kyoto, Japan, 2018

Awards

Büküşođlu E., Üstün Başarılı Genç Bilim İnsanı Ödülü, Türkiye Bilimler Akademisi, December 2021
Büküşođlu E., Bilim Akademisi Genç Biliminsanı Ödülü, Bilim Akademisi, April 2019