

ERIN B. MURPHY



Specialized Professional Competence

Failure analysis of polymer materials, including plastics, elastomers, and adhesives, in applications including consumer products, personal care products, construction materials, consumer electronics, medical devices, and industrial materials. Composition and trace component analysis of formulated materials, including complex fluids and compounded plastics and elastomers. Structure-property relationships of polymers and their environments.

Background and Professional Honors

B.S. (Chemistry), California Polytechnic State University, San Luis Obispo
B.S. (Biochemistry), California Polytechnic State University, San Luis Obispo
M.S. (Chemistry), University of California, Los Angeles
Ph.D. (Chemistry), University of California, Los Angeles

Managing Scientist,
Talas Engineering, Inc.
Managing Scientist,
Exponent, Inc.
Technical Leader – Oilfield Technologies,
Kraton Corporation
New Business Development Science Group Leader
Kraton Polymers
Staff Scientist
Kraton Polymers
Senior Scientist
Kraton Polymers
Scientist
Kraton Polymers
Postdoctoral Research Associate
Virginia Polytechnic Institute

Professional Activities & Memberships

Member, American Chemical Society
Polymers Division
Polymeric Materials: Science and Engineering Division
Member, Society of Petroleum Engineers
Member, Society of Plastic Engineers

Patents

Maris, C.A.L., Murphy, E., Bening, R.C., Wei, X., Muyldeans, X.D. (2020). Fusible oil gel compositions and methods of making and using same. U.S. Patent Application No. 20200399408(A1). Washington, DC: U.S. Patent and Trademark Office.

Bening, R.C., Murphy, E., Willing, C.L. (2019). Heat activated gel for cable filling applications. U.S. Patent No. 10, 287,428 B2. Heat activated gels for cable filling applications. Washington, DC: U.S. Patent and Trademark Office.

Bening, R.C., Murphy, E., Willis, C.L. (2018). Styrenic block copolymers as thermally-activated viscosifiers for oilfield applications. U.S. Patent No. 10,053,609 B2. Washington, DC: U.S. Patent and Trademark Office.

Maris, C.A.L., Murphy, E., Bening, R.C., Wei, X., Muyldeans, X.D. (2018). Fusible oil gel compositions and methods of making and using same. U.S. Patent Application No. 2018028227(A1). Washington, DC: U.S. Patent and Trademark Office.

Murphy, E.B., Nguyen, D.V., Bening, R.C. (2017). Curable, resealable, swellable, reactive sealant composition for zonal isolation and well integrity. U.S. Patent No. 9,657,213 B2. Washington, DC: U.S. Patent and Trademark Office.

Murphy, E., Bening, R.C. (2016). Low fluid loss drilling fluid compositions comprising diblock copolymers U.S. Patent No. 9,394,472 B2. Washington, DC: U.S. Patent and Trademark Office.

Murphy, E.B. (2016). Low viscosity synthetic cement. U.S. Patent No. 9,238,770 B2. Washington, DC: U.S. Patent and Trademark Office.

Selected Publications

Murphy EB. The return of photoelastic stress measurements: utilizing birefringence to monitor damage and repair in healable materials. *Journal of Materials Chemistry* 2011; 21:1438-1446.

Murphy EB, Wudl F. The world of smart healable materials. *Progress in Polymer Science* 2010; 35:223-251.

Murphy EB. Remendable Polymer Systems. In: Shinya, Norio, ed. *Frontiers of Self-Healing Materials and Applications*. Tokyo, Japan: CMC Publishing; 2010: 37-64.

Murphy EB, Bolanos E, Schaffner-Hamann, Wudl F, Nutt SR, Auad ML. Synthesis and characterization of a single-component thermally reversible polymer network: Staudinger and Stille revisited. *Macromolecules* 2008; 41 (14):5203-5209.

Braslau R, O'Bryan G, Nilsen A, Henise J, Thongpaisanwong T, Murphy E, Mueller L, Ruehl J. The synthesis and evaluation of new α -hydrogen nitroxides for 'living' free radical polymerization. *Synthesis* 2005; 9:1496-1506.

Selected Presentations

Murphy, EB. Failure Analysis of Polymers. Stanford AA252: Techniques of Failure Analysis, June 2020. (Invited Guest Lecture).

Murphy, EB. Taking 'Learn by Doing' to the Next Level: The World of Engineering & Scientific Consulting. Cal Poly San Luis Obispo Chemistry & Biochemistry Department Seminar Series, July 2018. (Invited Speaker)

Murphy EB. Reactive Sealant Technologies as Alternative Routes to Zonal Isolation, American Association of Drilling Engineers Fluids Management Study Group Meeting, Houston, TX, February 2017. (Invited Speaker).

Murphy EB. Utilization of Block Copolymer Technology in the Oil and Gas Industry. Iowa State University Department of Chemical and Biological Engineering Graduate Seminar Series, Ames, IA, October 2015. (Invited Speaker).

Murphy, EB. Pushing the Boundaries for Hydrocarbon Extraction in the Oil & Gas Industry Through Block Copolymer Technology. 249th ACS National Meeting & Exposition, Denver, CO, March 2015. (Invited Speaker).

Murphy, EB. In Situ Crosslinked Synthetic Cement for use in Cementing and Zonal Isolation. High Performance Elastomers and Polymers in Oil & Gas Applications, Aberdeen, UK, April 2012. (Invited Speaker).

Murphy, EB, Auad, ML, Wudl, F. Stimuli-Responsive Healable Materials: Diels-Alder Based Mending, International Conference on Self-Healing Materials, Chicago, IL, June 2009.