Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Joseph Hadden's expertise is in the electrochemistry of materials and lithium-ion batteries. During his time at Exponent, his work has focused on electronic devices with an emphasis on lithium-ion battery failure analysis, as well as corrosion and materials analysis for a variety of applications such as consumer electronics and the transportation industry. Dr. Hadden has an extensive background in materials characterization using a wide range of analytical techniques including X-ray computed tomography (CT), electron microscopy, X-ray diffraction (XRD), time of flight secondary ion mass spectrometry (ToF-SIMS), infra-red (IR) spectroscopy, and scanning ion-conductance microscopy (SICM). As well as electrochemical techniques such as electrochemical impedance spectroscopy (EIS) and various battery characterization tests.

Prior to joining Exponent, Dr. Hadden was a postgraduate Research Associate at Imperial College London. His research areas included, photoelectrochemical actuation, electrocatalysis for water splitting, and electrode materials for Li-ion batteries. His most recent work focused on studying the degradation of Li-ion battery electrodes using scanning ion-conductance microscopy.

Dr. Hadden retains these links to academia through a visiting researcher position at Imperial College London. Dr. Hadden's PhD was in the field of electrochemical capacitors, with a focus on the synthesis and characterization of mixed metal oxide nanomaterials. His work studied the structure/function relationship of these materials to elucidate their underlying charging mechanisms.

Academic Credentials & Professional Honors

Ph.D., Materials Research, Imperial College London, UK, 2019

Master of Chemistry, Chemistry, Durham University, England, 2015

Academic Appointments

Visiting Researcher, Department of Materials, Imperial College London, 2023.

Prior Experience

Postdoctoral Research Fellow, Department of Materials, Imperial College London, 2019-2022

Research Technician, Department of Materials, Imperial College London, 2018-2019

Graduate Research Student, Department of Materials, Imperial College London, 2015-2018

Professional Affiliations

Member of the Royal Society of Chemistry (MRSC) (2017 – Present)

Associate Fellow of the Higher Education Academy (AFHEA) (2018 – Present)

Publications

H. Zhang, P. Li, H. Zhou, J. Xu, Q. Jiang, J. H. L. Hadden, Y. Wang, M. Wang, S. Chen, F. Xie, D. J. Riley, Unravelling the synergy of oxygen vacancies and gold nanostars in hematite for the electrochemical and photoelectrochemical oxygen evolution reaction, Nano Energy, 2022, 94, 106968.

M. Attwood, D. K. Kim, J. H. L. Hadden, A. Maho, W. Ng, H. Wu, H. Akutsu, A. J. P. White, S. Heutz, M. Oxborrow, Asymmetric N-heteroacene tetracene analogues as potential n-type semiconductors, J. Mater. Chem. C, 2021,9, 17073-17083.

J.H.L. Hadden, M. Bouchet, G. Morgan, D.J. Riley, Mechanism of Actuation in Nickel Hydroxide/Oxyhydroxide Photoactuators, Advanced Materials Interfaces, 2021, 8 (24), 2101072.

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J.H.L. Hadden, M.P. Ryan, D.J. Riley, Is Nickel Hydroxide Charging Only Skin-Deep?, ACS Applied Energy Materials, 2020, 3 (3), 2803-2810.

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W. Song, J. Lischner, V.G. Rocha, H. Qin, J. Qi, J.H.L. Hadden, C. Mattevi, F. Xie, D.J. Riley, Tuning the Double Layer of Graphene Oxide through Phosphorus Doping for Enhanced Supercapacitance, ACS Energy Letters, 2017, 2, 1144-1149.

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