Exponent®
Engineering & Scientific Consulting

Andrew Dillon, Ph.D., P.E.

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Professional Profile

Dr. Dillon's expertise is in employing a multidisciplinary approach to the characterization and evaluation of medical devices throughout the total product lifecycle with a focus on benchtop and simulated analysis of thermal and electromagnetic interactions between medical devices and the human body.

Dr. Dillon has extensive experience in assessing risks and the evaluation of the safety of active and passive medical devices in MRI environments. Using multiphysics computational modeling, he has characterized thermal and electrical potential patient hazards patients in the MRI environment and determined worst-case configurations of modular medical devices to optimize and focus MRI-compatibility tests. He has designed, performed, and reviewed MRI-compatibility tests on medical devices ranging from large orthopedic product families and cardiac devices to cochlear implants and prototyped neurostimulators.

Additionally, he routinely applies his extensive background in material characterization and optoelectronics to evaluate medical device performance. This includes developing protocols to test on prototype devices, supporting compliance to MRI and EMC standards through customized testing and scientific rationale, and characterizing orthopedic wear debris and explanted medical devices. Dr. Dillon also has experience in design review and failure analysis of medical devices to support root cause investigations to identify factors impacting manufacturing throughput. Dr. Dillon’s technical work has also contributed to responses to FDA deficiency letters for regulatory submissions. He also has done extensive work in mining, compiling, and reviewing large and complex datasets using tailor-made automated data analytic tools.

Dr. Dillon obtained his Ph.D. in Chemical Engineering from Drexel University where he developed electrophoretic deposition of semiconducting nanocrystals for scalable and sustainable manufacturing of photovoltaics. This work spanned from the synthesis and preparation of colloidal nanocrystals to reactor design and electrophoretic deposition of semiconducting thin-films to optoelectronic and morphological characterization of the resulting deposits. In addition, he collaborated with the Material Science and Engineering department to explore solution-processing methods for fabricating transparent conductors with colloidal 2D Ti3C2.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, Drexel University, 2018

B.Sc., Chemical Engineering, University of Maryland, Baltimore County, 2013

Drexel College of Engineering Carleone Award, 2015-2016

Koerner Family Award, 2014-2015

Undergraduate Research Award, 2012

Licenses and Certifications

Professional Engineer Chemical, California, #7001

Prior Experience

Graduate Research Fellow, Drexel University, 2013-2018

Undergraduate Researcher, University of Maryland Baltimore County, 2012-2013

Undergraduate Research Fellow, National Institute of Standards and Technology, 2009

Patents

US20220181507A1: Physical forms of MXene materials exhibiting novel electrical and optical characteristics April 2022 (Michael J Ghidiu, Michel W Barsoum, Yury Gogotsi, Aaron Thomas Fafarman, FAFARMANAndrew DeVries Dillon)

Publications

A Dillon, M Ghidiu, A Krick, J Griggs, S May, Y Gogotsi, M Barsoum, A Fafarman. Highly Conductive Solution-Processed Two-Dimensional Titanium Carbide. Advanced Functional Materials, 2016.

A Dillon, S Mengel, A Fafarman. The Influence of Compact, Inorganic Surface Ligands on the Electrophoretic Deposition of Semiconductor Nanocrystals at Low Voltage. Langmuir. 2018.

A Dillon, L Quoc, M Goktas, B Opasanont, S Dastidar, S Mengel, J Baxter, A Fafarman. Thin Films of Copper Indium Selenide Fabricated with High Atom Economy by Electrophoretic Deposition of Nanocrystals Under Flow. Chemical Engineering Science, 2016.

S Dastidar, C Hawley, A Dillon, A Gutierrez-Perez, J Spanier, A Fafarman. Quantitative Phase-Change Thermodynamics and Metastability of Perovskite-Phase Cesium Lead Iodide. Journal of Physical Chemistry Letters, 2017.

G Ying, A Dillon, A Fafarman, M Barsoum. Transparent, Conductive Solution Processed Spincast 2D Ti2CTx (MXene) Films. Materials Research Letters, 2017.

B Nelson, E Petersen, B Marquis, D Atha, J Elliott, D Cleveland, S Watson, I Tseng, A Dillon, M Theodor, J Jackman. NIST Gold Nanoparticle Reference Materials do not Induce Oxidative DNA Damage. Nanotoxicology, 2013.

S Dastidar, D Egger, L Tan, S Cromer, A Dillon, S Liu, L Kronik, A Rappe, A Fafarman. High Chloride Doping Levels Stabilize the Perovskite Phase of Cesium Lead Iodide. Nano Letters, 2016.

G Ying, S Kota, A Dillon, A Fafarman, M Barsoum. Conductive Transparent V2CTx (MXene) films, FlatChem, 2018.

M Edley, B Opasanont, J Conley, H Tran, S Smolin, S Li, A Dillon, A Fafarman, J Baxter. Solution Processed CuSbS2 Films for Solar Cell Applications. Thin Solid Films, 2018.