Exponent®
Engineering & Scientific Consulting

Catrice Kees, Ph.D.

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Professional Profile

Dr. Kees is trained in materials engineering and is a physicist specializing in semiconductor devices and consumer electronics including thin-film electronics, light-emitting diodes (LEDs), and flexible optoelectronics. She has particular expertise in laboratory-based device testing, including photoluminescence (PL), ultra-violet/visible (UV-Vis) spectroscopy, and current-voltage (I-V) electrical testing.

Dr. Kees is also experienced with thin film device design, fabrication, metrology, root cause analysis, and manufacturing. She is well versed in experimental and theoretical methods used to evaluate new organic LED (OLED) device architectures and structures which led to efficiency and stability enhancements. She also has experience with using statistical modeling for data analysis of semiconductor dielectric thin film quality and particulate contamination issues in order to mitigate quality control excursions. Dr. Kees is proficient in multiple engineering software suites such as JMP, Mathematica, LabView, SQL, and Python.

Prior to joining Exponent, Dr. Kees was a TD Module & Integration Yield Engineer at Intel where she investigated and developed the next generation semiconductors in a cleanroom environment using Silicon Oxide (SiOx) and Silicon Nitride (SiNx) Plasma Enhanced Chemical Vapor Deposition (PECVD) production equipment. As a process engineer, she collaborated across functional teams to develop safety, quality, and maintenance training and guidelines for new engineers and manufacturing technicians.

Dr. Kees received her Ph.D. in the Materials Science & Engineering department at Rutgers University where she worked on blue polymer-based organic light-emitting diodes (P-OLEDs). Her graduate work consisted of a quantitative assessment of economic, energy, and sustainability impacts of different OLED device architectures, as well as theoretical electromagnetic simulations that demonstrated the local electromagnetic fields of metasurfaces can be used to improve the stability of phosphorescent OLED materials. Dr. Kees garnered knowledge in metallic and polymer thin film deposition techniques including spin coating, physical vapor deposition (PVD), electron-beam (E-beam) sputter deposition, and nanoimprint lithography. In addition, she utilized various metrology tools such as optical and dark-field microscopy, Scanning Electron Microscopy (SEM), and Atomic Force Microscopy (AFM) throughout her tenure.

Academic Credentials & Professional Honors

Ph.D., Materials Science & Engineering, Rutgers University, 2018

B.A., Physics, Carleton College, 2011

Prior Experience

TD Module & Integration Yield Engineer, Intel Corporation, 2018 - 2021

Languages

English

Publications

C.M. Carter, K. Gwynne, Z. Chen, K. Zhu, and D.M. O'Carroll, Stability and Radiative Rate of Blue Phosphorescence on Plasmonic Surface. Manuscript in Preparation.

A. K. Dalsania, J. Kohl, C. Kumah, Z. Shen, C.E. Petoukhoff, C. M. Carter and D.M. O'Carroll, Effects of metal film thickness and gain on the coupling of organic semiconductor exciton emission to surface plasmon polaritons. J. Mater Chem. C., 00,1-9 (2016).

C. M. Carter, J. Cho, A. Glanzer, N. Kamcev, and D. M. O'Carroll, Cost, energy, and emissions assessment of organic polymer light-emitting device architectures. J. Clean Prod., 137,1418-1431(2016).

D. M. O'Carroll, C. E. Petoukhoff, J. Kohl, B. Yu, C. M. Carter, S. Goodman, Conjugated Polymer-Based Photonic Nanostructures. Poly. Chem. 4, 5181-5196, review paper (2013).

Presentations

C.M. Carter, Z. Chen, K. Zhu, K. Gwynne, and D.M. O'Carroll, Photoluminescence Stability of Blue Organic Phosphorescent Materials on Silver Metasurface Electrodes. LSM/IAMDN (2017).

C.M. Carter and D.M. O'Carroll, Theoretical Predictions for Light Extraction Efficiency of Organic Polymer Light Emitting Diodes. SWE (2016).

C.M. Carter and D.M. O'Carroll, Light Extraction Efficiency Assessment of Organic Polymer Light-Emitting Device Architectures. MRS Fall (2015).

C.M. Carter, J. Cho, A. Glanzer, N. Karncey, and D.M. O'Carroll, Economic and Environmental Assessment of Organic Polymer Light Emitting Diodes. MRS Fall (2014).

C.M. Carter and D.M. O'Carroll, Economic and Environmental Assessment of Polymer Light Emitting Diodes. Africa MRS (2013).

C.M. Carter, T. Babakol, J.Brock, X. Fang, Y.Kim, Characterization of Oxygen Vacancies in SrTiO3. LSAMP (2011).

C.M. Carter, T. Babakol, J.Brock, X. Fang, Y.Kim, Characterization of Oxygen Vacancies in SrTiO3. CCMR (2010).

S. Schlotter, C.M. Carter, T. Brenner, B. Colwell, A. Kinsey, B. Schuster, M. Eblen-Zayas, Magnetic and transport properties of EuO films fabricated by oxidation of Eu metal films. APS (2010).