Arash Dehkordi Ph.D., PMP

Sr. Technologist & Program Manager

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Experienced technologist and R&D program manager with a proven record of leading complex, global industrial projects in the advanced materials sector. Skilled in bridging experimental R&D with strategic decision-making, I focus on quickly translating ideas into testable prototypes and embrace a "fail fast, fail smart" mindset. This quote by Feynman is one of my guiding principles, "No problem is too small or too trivial if we can really do something about it."

EXPERIENCE

Principal Scientist and R&D Manager
MAY 2020-MAR 2025
Kyocera International, Vancouver, WA

Led R&D and manufacturing-scale innovation in the Gallium Nitride value chain, developing 50 mm substrates while improving yield and quality for LED, AR/VR components, and Power Electronics customers. Reported to the Director of Crystal R&D and managed cross-functional projects and 3 direct reports.

- Led a strategic process improvement initiative, doubling material efficiency from **25% to 52%** while **improving all quality metrics** within 10 months.
- Managed a new product introduction (NPI) effort to launch a strategic wafer offering for the III-Nitrides power electronics market.
- Oversaw LEO seed processing line in Class 1000 cleanroom: **reduced seed failure rate by 40%** and **increased on-time delivery by 60%**
- Championed the site's first SCADA/data historian implementation, from concept and RFI/RFQ to execution delivering real-time process data acquisition for growth tools using **Ignition and SQL**, enabling live process monitoring and python-driven part inspection via image processing workflows.
- Built and maintained **Python and SQL-based pipelines** to ingest, structure, and analyze high-volume growth and process data across multiple tools and runs.
- Performed **statistical analyses** (**t-tests, ANOVA, regression)** to quantify process variable impact on crystal quality, driving evidence-based optimization.
- Enabled robust **SPC monitoring** and big data-driven decision making by integrating custom analytics with live data streams.

Sr. Materials Scientist & Project Manager
MAY 2017-MAY 2020
GCL Solar Materials, St. Charles, MO

Managed large-scale R&D and quality improvement projects for 200 mm photovoltaic and 300 mm semiconductor silicon ingots, reporting directly to the VP of Crystal Growth. Oversaw a global cross-functional team of scientists and engineers across high-impact projects spanning process innovation and cost reduction in support of HVM for Continuous Czochralski (CCz) mono-Si.

- Executed an HVM cost-reduction program on quartz crucibles, from supplier evaluation to qualification, including supplier visits in China. Delivered

EDUCATION

Materials Science & Eng., Ph.D.
Clemson University
Clemson, South Carolina
AUG 2011 - AUG 2014
GPA: 4.00/4.00

Physics., M.Sc.
Sharif University of Technology
Tehran, Iran
AUG 2006 - JAN 2009
GPA: 3.72/4.00

Applied Physics., B.Sc.
Azad University
Qazvin, Iran
AUG 2001 - MAY 2005
GPA: 3.40/4.00

SKILLS

Programming & Analytics
Python (Pandas, NumPy, SciPy, statsmodels, OpenCV, matplotlib, seaborn), SQL, MATLAB, JMP, Git

Statistical & Data Science Methods
SPC, DOE, t-tests, ANOVA, regression modeling

Process & Systems
SCADA (Ignition), Real-time data acquisition, Image processing automation, Cleanroom operations, complex multi variable process optimization

Project Management
PMP certified, project chartering, trade-off analysis & structured decision-making, scrum/gantt hybrid planning, earned-value management, risk mitigation, cross-functional leadership

multi-million-dollar annual savings with no adverse impact on key process metrics; earned the GCL Poly Best Team Award (2017).

- Enhanced and owned a bottoms-up manufacturing cost model by integrating Monte Carlo simulation to capture probabilistic yield. The model supported executive strategic decisions, project prioritization, competitor analysis, and annual R&D roadmap development.

Research Materials Scientist
NOV 2014-MAY 2017

SunEdison/MEMC, St. Peters, MO

Led the quartz crucible program for CCz Silicon crystal growth, reporting to the Director of Crystal Growth. Responsible for supplier evaluation, post-mortem failure analysis, assessment of crucible impact on crystal yield and quality.

- Developed a predictive crucible service life model based on a self-built database of post-mortem analyses. Personally inspected the crucible wall cross sections from hundreds of production runs, quantifying bubble distribution and categorizing failure modes. The model enabled accelerated qualification of new suppliers by correlating early-run cross-section data with expected service life.
- Developed a Should-Cost model based on historical RFQ data and supplier visit insights to estimate crucible cost structure and support purchasing decision and long-term cost roadmaps
- Designed and executed a series of experiments that helped close a critical cell efficiency gap vs. a competitor (as part of a task force led by CTO)
- Developed a simplified Shockley-Reed-Hall (SRH) model and an impurity mass balance model to support process understanding on minority carrier lifetime

SELECTED PUBLICATIONS

- A. M. Dehkordi et al., "Thermoelectric Power Factor: Enhancement Mechanisms and Strategies for Higher Performance Thermoelectric Materials", Mater. Sci. Eng. R: Reports 97 (2015) 1-22 (Review Article)
- A. M. Dehkordi et al., "New insights on the synthesis and electronic transport in bulk polycrystalline Pr-doped SrTiO3-δ", J. Appl. Phys. 117 (2015) 055102 [February 7th, 2015 front cover]
- A. M. Dehkordi et al., "Large Thermoelectric Power Factor in Pr-doped SrTiO3-δ Ceramics via Grain Boundary-Induced Mobility Enhancement", Chem. Mater. 26 (2014), 2478 [April 8th, 2014 front cover]
- A. M. Dehkordi et al., "Significant Enhancement in the Thermoelectric Properties of SrTiO3 Ceramics Originating from Non-Uniform Distribution of Pr Dopants", Applied Physics Letters 104 (2014), 193902
- A. M. Dehkordi and J. C. Holzer, "Synthetic Lined Crucible Assembly for Czochralski Crystal Growth", US20190203377A1 (2019)
- A. M. Dehkordi and J. C. Holzer, "Hybrid Crucible Assembly for Czochralski Crystal Growth", US20190078231A1 (2019)

Hands-On Materials Characterization and Analysis
XRD, SEM, EDS, SIMS, FTIR, UV-Vis Spectroscopy, Optical and Nomarski Microscopy

AWARDS

Project Management Professional (PMP) certification, Credential ID 2752690 (active since Feb 2020)

GCL Poly Best Team Award 2017, GCL Poly (2017)

Green Belt Certification, SunEdison (2016)

International Thermoelectric Society (ITS) Graduate Student Award (2014)

2 Journal Front Covers