

Benjamin M. Rathsack

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OBJECTIVE

Attain a Ph.D. internship for the summer of 2000 in advanced photoresist development, lithography simulation or alternative microfabrication processes

EDUCATION

UNIVERSITY OF TEXAS Austin, TX 8/ 97 – present Chemical Engineering, Ph.D. Candidate, GPA 3.9/4.0, Advisor: Professor C. Grant Willson: Research on photoresist characterization and optical microlithography simulation for semiconductor applications. Develop photoresist photokinetic and dissolution mathematical models. Simulated and fabricated resist processes that decrease resist feature size by 40% for 365 nm laser photomask fabrication processes. Developed and characterized a resist chemistry for a new 257 nm laser photomask writer. Built a custom 257 nm laser exposure system and process controlled hot plate for photoresist characterization. Manufacturing collaborations with ETEC Systems, Inc and the Dupont Photomask Reticle Technology Center. Skills: Lithography simulation, Labview, Visual basic, photokinetics and thin film polymers

UNIVERSITY OF ILLINOIS Champaign/Urbana, IL, Chemical Engineering, BS, May 1996
GPA 4.96/5.0, Class Rank: 1 out of 64 graduates

HANRATTY RESEARCH GROUP Urbana, IL 1/95 - 5/96

Senior Thesis Research Research in fluid mechanics on the development of an optical technique that measures spatial wave slopes at an air/water interface; Spatial wave slopes are related to wave energy, wave size and oxygen transfer through an interface; Work accepted for a poster display at the *AICHE Annual Meeting* in Chicago (1996); Skills: digital imaging (optical scanners), UNIX workstation operation, FORTRAN programming, AUTOCAD design software, AUTOLISP programming and autocorrelation function calculations for a statistical wave surface analysis

WORK EXPERIENCE

PROCTER AND GAMBLE Cincinnati, OH 6/96 –7/97

Research and Product Development Process development of Cascade dish washing detergent in the Laundry and Cleaning Products Division; Development of powder detergent granules through plant and pilot plant experimental trials (powder processing through agglomeration, fluid bed drying and granule size reduction); Polymer encapsulation and stabilization of bleach (shock sensitive organic peroxide) using twin-screw polymer extrusion; Initiated the development of a new powder characterization technique used to measure powder particle sizes, shapes and surface fractures with image analysis; Image analysis technique developed in cooperation with Corporate Research and tested in applications for multiple corporate divisions; Skills: process development, design of experiments, total quality management and brand management

3M COMPANY St. Paul, MN 5/95 - 8/95

Process Engineering Internship Process development in a manufacturing technology group of the Traffic Control Materials Division; Development of an electrostatic coating process for pavement marking adhesive tape; Set-up of a neural network process modeling program for a microreplicated reflective tape; Skills: design of experiments, neural network modeling, thin film polymer extrusion, polymer stress testing and pavement marking tape testing in Fort Lauderdale, FL

PROCTER & GAMBLE Cincinnati, OH 5/94 - 8/94

Research and Development Internship Research in a products research team of the Laundry and Cleaning Products Division; Research on particulate (pigment/ iron oxide) stain removal with heavy duty liquid laundry detergents (Tide); Skills: interfacial surface chemistry (surfactant-metal oxide interactions), surfactant-enzyme interactions for protein stain removal and integration of consumer needs into detergent formulation through a world liquid detergent team

ANDREWS ENVIRONMENTAL ENGINEERING CONSULTING Springfield, IL 5/93 - 8/93

Summer Internship Ground water chemical analysis statistics for landfill water monitoring wells; aid in water sampling and surveying; environmental remediation; knowledge of EPA solid waste management regulations (RCRA laws)

ACTIVITIES AND HONORS

Undergraduate Organizations

AICHE
Phi Eta Sigma (Fr. honors society)
Phi Lambda Upsilon (ChE honors)
Engineering Open House projects (3)
Golden Key Honors Society
Engineering Explorers (president)
GSEC Committee Member

Awards (\$ 20,000)

Bronze Tablet
3M Engineering Scholar (2)
Procter and Gamble Leadership
Dow Outstanding Junior
Consulting Engineers Council (2)
McCourtney Scholarship (4)
Reynold Fusion Award
Arthur Sloan Prize
James Scholar

Activities

Intramural Softball (coach)
Intramural Hockey

Graduate Organizations and Awards

SRC/ Texas Instruments Fellowship (1998)
Co-leader of Chemical Engineering Graduate Student (GSEC) Fundraiser (1998)
Leader of Chemical Engineering Graduate Student (GSEC) Recruiting (1999)
UT/ College of Engineering Thrust 2000 Scholarship (1999)

PUBLICATIONS

1. B. M. Rathsack, P. Tatersall, C. E. Tabery, T. Stachowiak, T. Dallas, M. Pochkowski and C. Grant Willson, University of Texas at Austin, Department of Chemical Engineering/ ETEC Systems Inc, *Characterization and Development of a DUV Non-Chemically Amplified Resist for Photomask Fabrication using a 257 nm Optical Pattern Generator* **Bacus (1999)**.
2. B. M. Rathsack, C. E. Tabery, M. Pochkowski, C. Philbin and C. Grant Willson, University of Texas at Austin, Department of Chemical Engineering, ETEC Systems Inc./ DPI Reticle Technology Center LLC, *Organic Antireflection Coatings for Photomask Fabrication using Optical Pattern Generators* **Bacus (1999)**.
3. B. M. Rathsack, C. E. Tabery, S. A. Scheer, C. Grant Willson, Univ. of Texas/ Austin, C. L. Henderson, Georgia Institute of Technology, M. Pochkowski, ETEC Systems, Inc., Cece Philbin, Reticle Technology Center (DPI) and P. D. Buck Dupont Photomask, *Photoresist optimization and process simulation for laser photomask microlithography*, **Proc. SPIE (1999)**.
4. B. M. Rathsack, C. E. Tabery, S. A. Scheer, C. L. Henderson and C. Grant Willson, *Photoresist Optimization for Laser Photomask Applications*, **Techcon (1998)**.
5. Clifford L. Henderson, Steven A. Scheer, Pavlos C. Tsiartas, Ben M. Rathsack, John P. Sagan, Ralph R. Dammel, C. Grant Willson, *Modeling Parameter Extraction for DNQ-Novolac Thick Film Resists*, **Proc. SPIE (1998)**.

GRADUATE CLASSES

Semiconductor microlithography (Mack)
Introduction to electronic devices
Chemical process in microelectronics
Chemical engineering mathematical analysis

Polymer science
Polymer processing lab
Mass transfer
Kinetics

Biomolecular recognition
Tissue engineering