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Marc Schrier

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Objective:

An industrial research position in which my interdisciplinary talents in inorganic solid state chemistry, analytical chemistry, physics, materials science, and experimental design will be effectively utilized and challenged.

Education:

University of California, Berkeley, CA 94720, Aug. '93 to Summer '01.

Ph.D. in Inorganic Solid State Chemistry. Dissertation: Oxidation Control of Fluxes for Mixed-Valent Inorganic Oxide Materials Synthesis. Summer 2001.

University of California, Santa Barbara, CA 93106. Sept. '88 to June '92.

B. S. in Chemistry, Honors, June '92. Dean's Honor List: Winter '90, Winter '91, and Spring '91

Awards:

President's Undergraduate Fellowship 1990-1991 & 1991-1992

Willard L. McRary Prizes in Chemistry 1992

Research Experience:

University of California, Berkeley:

Graduate Research Assistant; 1993-1999: Professor Angelica M. Stacy, Dept. of Chemistry

Investigated the synthesis of mixed-valent oxide materials from molten alkali nitrate and hydroxide fluxes. Developed new routes to use additives to effectively control the electrochemical potential of molten fluxes to direct the level of doping in mixed-valent metal oxide materials. Optimized and characterized a reaction for the controlled potassium-doping of the barium bismuth oxide ($Ba_{1-x}K_xBiO_3$) superconductor by varying flux cation concentrations in molten alkali metal nitrates. Developed routes to control and reduce sodium and alkaline earth-doping of the lanthanum copper oxide ($La_{2-x}A_xCuO_4$ A=Na, Ca, Sr, Ba) superconductors with mixed molten alkali metal nitrate and hydroxide fluxes. Developed routes to prepare copper metal/oxides in their 0, +1, +2, and +3 oxidation states from molten hydroxides. Identified and optimized the synthesis of a new sodium silver copper oxide from molten hydroxide fluxes. Developed a model for, and investigated solid state, flux, glycothermal, and hydrothermal routes to synthesize and characterize, an environmentally-friendly Chilean sulfur-free K/Cu/Mn/Co/O copper ore. Identified and developed a hydrothermal route to tune and control the surface area from 20 to 165 m^2/g of transition metal-doped birnessite, a likely catalyst precursor.

University of California, Santa Barbara:

Independent Studies Research; 1990-93: Professor Galen D. Stucky, Dept. of Chemistry

Undergraduate Research; 1988-89: Professor Galen D. Stucky, Dept. of Chemistry

Grew $KTiOPO_4$ (KTP) crystals, doped metals into the structure, and explored structural and optical transitions. Studied Cs/Zn/ PO_4 's and Cs/Zn/ AsO_4 's, a new class of open framework molecular sieves with potential applications in chiral separations and catalysis. Hydrothermally explored the Ti/ IO_3 phase space and developed a new nonlinear optical (NLO) material with an exceptionally large Second Harmonic Generation (SHG).

University of California, Los Angeles:

Staff Research Associate; 1990-92: Professor M. Frederick Hawthorne, Dept. of Chem. & Biochem.

Lab Helper; 1988-90: Professor M. Frederick Hawthorne, Dept. of Chem. & Biochem.

Synthesized and purified of a variety of substituted organoboranes. Collaborated on a Boron Neutron Capture Therapy of cancer project (BNCT) with the City of Hope National Medical Center, Duarte, California. Synthesized several tetradecapeptide manifolds equipped with the proper functional groups for later conjugation with ^{10}B -enriched carborane-containing peptides to be linked with a tumor-directing antibody to be attached *in vivo* to cancerous tumors.

University of Illinois at Urbana-Champaign:

NSF Solid State Inorganic Chem. Summer Fellow; 1991: Professor Walter Klemperer, Materials Chem.
Investigated the growth of microporous aluminophosphate molecular sieves and their suitability for seeded hydrothermal crystal growth. Varied reaction conditions to observe their influence on the phase, size, morphology, and quality of the crystals.

Work Experience:

Isoflex USA, P. O. Box 29475, San Francisco, CA 94129-0475

Chemistry Consultant - 1999 to present

Purification and compounding of stable isotopes. Investigating DOE privatization of a laser-based isotope separation technology (AVLIS).

Applied Phase Transition, 1758 Berkeley St., Santa Monica, CA 90404

Chemistry Consultant - 1999 to 2000

Investigated metal-insulator transition in vanadium oxides as part of a DARPA-funded project into a next generation e-beam lithography inorganic resist candidate for use in sub 100nm semiconductor fabrication.

University of California, Berkeley:

Graduate Student Instructor - Crystallography, Dept. of Chemistry

Assisted in instructing a graduate level course on X-ray diffraction and structure solution on a new single crystal Siemens SMART area detector diffractometer.

Output Enablers, 1678 Shattuck Ave., Suite 247, Berkeley, CA 94709, www.io.com/~oe

Founding Partner/Hardware Designer/Accountant - 1994 to present

Manufacturers of low cost, non-invasive hardware clock chipping accelerators for Macintosh's.

Skills:

Synthetic: Nonaqueous flux, sub and super critical hydrothermal, classical solid state, RF and DC magnetron sputtering, RF plasma etching, inert atmosphere and high vacuum techniques.

Analytical: Powder and single crystal X-ray diffractometry, thermogravimetry, magnetometry, scanning electron microscopy, potentiometry, and e-beam microprobe wavelength dispersive, second harmonic generation (SHG), AA, diffuse reflectance UV-Vis, and XRF spectroscopies.

Computer: Macintosh expert, web site administrator, proficient with UNIX, VMS, Dos, Windows, data acquisition and processing, CAD, database, spreadsheet, graphics.

Equipment: Managed a powder diffraction user facility, trained and consulted users, aligned and maintained a Siemens D5000 Powder Diffractometer and related data collection, cell and structure analysis software. Well versed in electronics and machining.

Lab Organization: Modified research lab architectural drawings, collaborated work with shops, organized lab move. Trained new undergraduate, graduate, and postdoctoral researchers.

Affiliations:

Member, The Berkeley Earth Resources Systems Center, UC Berkeley

Member, American Chemical Society (1991-present)

Member, Materials Research Society (1996-present)

Phi Lambda Upsilon Honorary Chemical Society 1992

Hobbies and Interests:

Scuba diving, hiking, camping, backpacking, reptiles, computers, pyrotechnics, and photography.

References:

Professor Angelica Stacy
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Professor George Brimhall
Geology Department
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(510) 642-5868
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Professor Galen Stucky
Department of Chemistry and Materials
University of California
Santa Barbara, CA 93106
(805) 893-4872
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Presentations:

Invited talk entitled "Tuning Fluxes for Inorganic Oxide Materials Synthesis" at the Laboratory for the Science and Application of Catalysis, March '99.

Invited talk entitled "Tuning Fluxes and Reactants for Inorganic Oxide Materials Synthesis" at Lawrence Livermore National Laboratory, October '98.

Presented a poster entitled "Characterization and Synthesis of an Environmentally-Friendly Chilean Copper Ore" at the 1997 Solid State Gordon Conference in Oxford, England.

Presented a poster entitled "Characterization and Synthesis of an Environmentally-Friendly Chilean Copper Ore" at the VIth European Conference on Solid State Chemistry in Zürich, Switzerland.

Presented a talk entitled "Controlled Doping in Alkali and Alkaline Earth Metal Doped Lanthanum Copper Oxide Superconducting Materials Prepared from Molten Alkali Metal Hydroxide Fluxes" at the symposium "General Solid State Chemistry" at the 1997 National ACS meeting in San Francisco.

Presented a talk entitled "Molecules to Chains to NLO Materials; Titanyl Iodate" at the symposium "General Solid State Chemistry" at the 1997 National ACS meeting in San Francisco.

Invited talk entitled "Characterization of a Chilean Potassium Copper Manganese Oxide Ore" at the Berkeley Earth Resources Systems Center.

Presented a talk entitled "Effects of Additives in Controlling the Synthesis of Mixed Valent Copper (II-III) Oxides in Molten Alkali Metal Hydroxide Fluxes" at the symposium "Solid State Chemistry" at the 1996 Regional ACS meeting in San Francisco.

Manuscripts in Preparation:

"Direct Precipitation of $Ba_{1-x}K_xBiO_3$ Superconductors from Molten Alkali Metal Nitrates below $300^\circ C$ ", Linda N. Marquez, Marc D. Schrier, and Angelica M. Stacy, to be submitted to Chemistry of Materials.

"Molecules to Chains to NLO Materials: Titanyl Iodate", Marc D. Schrier, Xianhui Bu, and Galen D. Stucky, to be submitted to the Journal of the American Chemical Society.

"Controlled Doping of the $La_{2-x}Na_xCuO_4$ Superconductor from Mixed Hydroxide and Nitrate Fluxes", Marc D. Schrier and Angelica M. Stacy.

"Aluminosilicate Syntheses from Molten Hydroxide Fluxes", Marc D. Schrier, Anne Dolbecq, and Angelica M. Stacy.

"Chemical Model for Transition-Metal-Doped Birnessite Ores", Karen L. Frindell, Marc D. Schrier, and Angelica M. Stacy.

"Low Temperature Reduction of Copper Oxides from Molten Hydroxide Fluxes", Marc D. Schrier and Angelica M. Stacy.

"Controlled Hydrothermal Synthesis of Variable Surface Area Transition Metal-Doped Birnessite", Marc D. Schrier and Angelica M. Stacy.