CURRICULUM VITÆ

RODOLFO PINAL, Ph.D.

Purdue University
Department of Industrial and Physical Pharmacy
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West Lafayette, IN 47907
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EXPERIENCE:

2009-Present	Associate Professor
2003-2009	Assistant Professor
Department of Industrial and Physical Pharmacy Purdue University	

Research:

Leading and conducting graduate level research in the study of some of the most prevalent problems encountered during pharmaceutical product development, such as solubility, solubilization and drug delivery, from the theoretical framework provided by the properties of liquid (fluid and amorphous) mixtures. Drug-polymer and drug-lipid mixtures as systems for improved solubility, dissolution and drug delivery are among current research projects.

Solubility, solubilization and drug delivery of liquid mixtures and amorphous systems.

- Methods for enhancing oral bioavailability of poorly soluble active compounds
- Relationship between chemical structure and physical properties responsible for the solubility of drugs
- Development of amorphous formulations with improved drug solubility
- Stabilization of amorphous formulations through the study, modeling and control of molecular mobility

Study of polymeric excipients and their interactions in pharmaceutical systems

- Investigation of the effect of polymer-plasticizer interactions on the mechanical and mass transport properties of pharmaceutical polymers
- Dispersions of drug microparticles in polymeric films as drug delivery systems
- Production of spatially dispersed, stable nanocrystals for delivery of highly insoluble anticancer drugs via transcytosis
- Development of polymeric strip films containing immobilized, spatially disperse API micro- and nano-particles

Pharmaceutical Processing

- Influence of excipient raw material physical properties on the quality attributes products made by roller compaction
- Use of acoustic emission for the continuous monitoring and control of pharmaceutical manufacturing processes

Teaching:

Teaching of undergraduate and graduate level courses on Pharmaceutics, Pharmaceutical Technology and Drug Delivery. Specific teaching assignment of Sterile Products, a required course for senior pharmacy students.

Code	Course	Role
IPPH 471	Parenteral Products	Instructor
IPPH 562	Manufacturing Processes	Guest Instructor
IPH 587	Pharmaceutical Solids	Assisting Instructor
IPPH 521	Drug Development	Guest Instructor
IPPH 690A	Solids Discussion Group	Assisting Instructor
IPPH 590	Applied Thermodynamics	Instructor

Administration:

- Chair, Graduate Admissions Committee, Industrial and Physical Pharmacy. Evaluate application materials for students wanting to pursue a Ph.D. degree in the department. Conduct one-to-one interviews with applicants. Assess applicants' scientific and academic qualifications for admission to the department. Vote on admission/non admission of student applicants. 2006 - Present.
- Associate Director, Center for Pharmaceutical Processing Research (CPPR). 2004.
- Director, NSF-I/UCRC Dane O. Kildsig Center for Pharmaceutical Processing Research (CPPR). 2005 - Present.
- Health and Safety Committee, College of Pharmacy. 2007 - Present.
- Chair, Faculty Search Committee, Endowed Professorship, Department of Industrial and Physical Pharmacy. 2010.
- Assessment Committee, College of Pharmacy. 2010 – Present
- Graduate Fellowships Committee, Convener, 2011

Theses directed:

Chen Mao, Ph.D. 2006. Structural relaxation and molecular mobility in organic amorphous pharmaceutical compounds.

Fabrice Gusching, M.S. 2006. Antiplasticization of pharmaceutical polymers (Antiplasticisation des polymères à usage pharmaceutique), Univesité Louis Pasteur, Strasbourg, France. Co-advisor.

François-Xavier Diringer, M.S. 2007. Influence of moisture on the ability of microcrystalline cellulose to form tablets. Univesité Louis Pasteur, Strasbourg, France. Co-advisor.

Sai Prasanth Chamarthy, Ph.D. 2007. The different roles of suface and bulk effects on the functionality of

pharmaceutical materials. Purdue University.

Carole Bucher, M.S. 2008. Assessment of the distribution of API microparticles in polymeric films. Univesité Louis Pasteur, Strasbourg, France. Co-advisor.

Michelle K. Papp, Ph.D. 2009. Application of acoustic emission to the monitoring of pharmaceutical unit operations. Purdue University

Nathan A. Boersen, Ph.D. 2009. The development of roller compacted formulations using multivariate and dimensional analysis. Purdue University.

Ji-Young Kim, Ph.D. 2009. Hydrotropic solubilization of poorly soluble drugs. Purdue University.

Maria Elisa Luque. M.S. 2010. Toward the development of an ontological framework for drug-loaded film manufacture. Dept. of Chemical Engineering. Co-advisor

1999-2003	Research Leader (Solid-State Pharmaceutics)
1997-1999	Principal Scientist (Solid-State Pharmaceutics)
Pharm. and Anal. R&D	
Hoffmann-La Roche	

Physical characterization of solids and Particle Technology. Supervisory responsibility for the group's activities and capabilities: X-ray powder diffraction, DSC and hot stage microscopy, TGA/IR, SEM, Image Analysis, particle size by Laser diffraction and Dynamic Light Scattering, Hygroscopicity (microbalance), Microcalorimetry (TAM), BET gas adsorption and gas pycnometry.
Responsible for identifying and devising methods for the measurement and monitoring of physical properties/parameters critical for the development of a given specific product or process. Responsibilities include the physical characterization of active ingredients, final dosage forms and intermediate blends. Work with formulation and process development scientists in troubleshooting powder technology issues of processability such as flowability, granulation and dissolution during development and technology transfer.

Leader of the Integrated Solid-State Strategy Team among international development centers for various projects. Designed and instituted methodology necessary for evaluating the physical attributes and stability for an amorphous formulation technology used in clinical trials. Work with Chemical Synthesis designing and implementing crystal polymorph screening strategy for new chemical entities during preclinical development and Kilo-lab production. Responsible for writing the IND and NDA sections on crystal polymorphism.

Provide official characterization data to Analytical groups on drug substances and formulations for GLP and cGMP qualification. Responsible for the regulatory compliance of the Solid State Pharmaceutics laboratory. Responsible for the development and validation of physical testing methods for regulatory submission and transfer to Quality Management for testing during production. Responsible, in the capacity of System Owner, for the Computer System Validation plan and implementation as dictated by 21CFR part 11 for instrumentation in the Solid State Pharmaceutics Laboratory. Technical Team Leader for preclinical activities (CMC section) of international project. Coordinate activities among scientists in the U.S., Germany and Switzerland, integrating Discovery Pharmacology, chemical supply, formulation and manufacturing, Toxicology and Pharmacokinetics.

1993-1997	Principal Scientist
Pharmaceutical R&D	Sterile Dosage Forms
Hoffmann-La Roche	

Developed injectable formulations for Phase 00 and Phase 0 studies. Worked in the solubilization and formulation of organic molecules to support Drug Discovery, early Toxicology and Pharmacokinetics. Setup the capability for injectable emulsion technology in the group to support proof-of-concept efforts in Discovery.

Specific assignments: Parenteral development team leader for a polypeptide molecule in Phase II/III.

Formulation research and GLP manufacture, compatibility testing with manufacturing process/materials. Formulation development and manufacture of IND-enabling stability lots, issue Directions for Manufacture of cGMP clinical lots and complete transfer to clinical supplies manufacturing area. Coordinate clinical supply manufacturing and analytical (stability, release, and cleaning assessment) activities with CMC leader for regulatory submissions and shipment to the clinic.

Formulation scientist responsible for small molecule, line extension product. Manufacture of ANDA-enabling stability lots. Primary container selection studies, stopper extractables, tubing and filter membrane compatibility studies. Development of a manufacturing process suitable for trade lots. Preparation of Research Directions for technology transfer, scale-up and manufacture of exhibit lots. International Team Leader for project focused on the identification and evaluation of new technologies for drug delivery and drug development.

1991-1993 1990-1991 Pharmaceutical R&D Hoffmann-La Roche	Senior Scientist (Preformulation) Research Associate (Preformulation)

Physicochemical characterization of new drug candidates. Development of stability-indicating methods, HPLC, TLC, UV/IR and Fluorescence spectra. Stability screening in solution and solid state, pH-solubility profile, pH-stability profile and kinetics, pK_a determination. Photodegradation and drug-excipient compatibility studies, accelerated stability. Solubility/solubilization and partitioning studies. Developed a method for measuring partition coefficients using solid phase extraction.

Also responsible for studies intended to address issues specific to discovery or development programs: QSAR studies to support drug discovery, studies on drug sorption to valve-gaskets to support aerosol development, compaction studies to support solid-dosage form formulation.

1988-1990 Soil Science Department University of Florida Gainesville, Florida	Post-Doctoral Research Associate (Research on the fate and transport of organic compounds in complex mixtures)

Responsible for all major technical aspects of the project: designing and conducting experiments, planning of future work, preparing and presenting progress reports to the sponsoring agency.
Analytical (HPLC) method development, chemical and scintillation counting analyses in multi-component, multi-phasic matrices, extensive measurements of solubility/partitioning in miscible and immiscible solvent mixtures, and of sorption/partitioning to natural and synthetic polymers.

Computer modeling of data; developed and published a model to predict solubility of organic compounds in non-ideal solvent mixtures.

1985-1988 College of Pharmacy University of Arizona	Graduate Research Assistant

Graduate research on the theoretical and practical aspects of solubility and solubilization. Study of the relationship between chemical structure and the physicochemical properties of organic molecules in solution. Measurement of solubility and solubilization profiles in pure and mixed solvents. Extensive use of QSAR (Quantitative Structure-Activity Relationships) techniques including computer programming for modeling, computer data management, statistical analysis, and report generation.

1984-1985	Graduate Teaching Assistant

College of Pharmacy
University of Arizona

Teaching Pharmaceutics laboratory to undergraduates. Preparation of short introductory lecture for each session. Guiding students through the experimental exercise. Reviewing and grading students' formulated product for appearance, yield and labeling. Reviewing pre-session homework assignments, preparing and grading laboratory tests.

1981-1982 Laboratory Assistant
Section of Microbiology
National University of Mexico

Preparing (compounding, filling and sterilizing) all necessary culture media for undergraduate Microbiology laboratory sessions. Preparing dyes used for visualization/identification of bacteria. Maintaining stock of sterilized glassware and materials needed for laboratory sessions.

EDUCATION:

1984-1988	Ph.D. in Pharmaceutics Minor: Physical Chemistry University of Arizona Dissertation: Estimation of Aqueous Solubility of Organic Compounds.
1983	Internship: National General Hospital, Mexico and National University of Mexico
1978-1982	B.S. in Biopharmaceutical chemistry National University of Mexico Mexico City, Mexico

PROFESSIONAL MEMBERSHIPS:

American Chemical Society
American Association of Pharmaceutical Scientists
American Association of Colleges of Pharmacy

DISTINCTIONS AND AWARDS:

Peer Recognition	Respiratory Drug Delivery **VI,** Virginia Commonwealth University, p. 284 (1998). *J. Pharm .Sci.*, **83**, p. 1216 (1994); *Pharm. Tech.*, **18**, p. 159, (1994). "Water Solubility. Methods of Estimation for Organic Compounds" by S. H. Yalkowsky and S. Banerjee. Marcel Dekker, 1991.
1983	Diploma: Third highest undergraduate GPA National University of Mexico.
1987	Rho Chi Honor Society University of Arizona, Tucson, AZ.

1990	Project Reviewer Electric Power Research Institute, Palo Alto, CA.
1995	Special Recognition Bonus: Departmental coordinator for Preclinical Development redesign.
1996	Management Incentive Bonus
1997	Recognition Award for 1996 Special Recognition Award for International Team Leader work
1999	Recognition award for characterization work on novel amorphous formulation
2000-2002	Land-O-Lakes Pharmaceutical Conference planning committee member
2003	Chair Land-O-Lakes Pharmaceutical Conference University of Wisconsin Theme: Molecular Pharmaceutics
2003	Silver Award Roche Research Olympiad For contribution on Integrated Drug Development work
2004	Associate Director. Center for Pharmaceutical Processing Research, Purdue University
2004	Purdue Research Foundation Fellowship. “Applications of hot-melt extrusion to the production of drug dispersions with improved drug delivery attributes for poorly soluble drugs.” (Sai Chamarthy)
2005	Arden House Pharmaceutical Conference. Planning committee. Pharmaceutical Materials Science
2006	Proposal Reviewer National Science Foundation
2006	Seed for Success Award. Purdue University.
2007	Seed for Success Award. Purdue University.
2007	Schering-Plough Science & Innovation Award (Sai Chamarthy)
2007	Bilsland Doctoral Fellowship (Sai Chamarthy)
2008	Book proposal reviewer. Wiley Books.
2008	Jenkins Knevel Award for Outstanding Graduate Research (Michelle Papp)
2008	Lieberman Award for an outstanding graduate student in Industrial and Physical Pharmacy (Ryan McCann)
2008	Dean’s Medal for distinguished service. Faculty of Pharmacy. Louis Pasteur University, Strasbourg, France.
2008	Proposal Reviewer National Science Foundation
2009	Entrepreneurial Leadership Academy Fellow. Purdue University
2010	Session Organizer, Thermo-Mechanical Response of Molecular

	Solids: Multi-Resolution Theory, Simulations, and Experiments: Polymers and Composites. TMS 2010. 139th Annual Meeting and Exposition, The Minerals, Metals & Materials Society, Seattle, Washington.
2010	Session Chair, Thermo-Mechanical Response of Molecular Solids: Multi-Resolution Theory, Simulations, and Experiments: Molecular Solids I. TMS 2010. 139th Annual Meeting and Exposition, The Minerals, Metals & Materials Society, Seattle, Washington.
2010	Faculty Awards of Excellence. Team Award, Pharmaceutical Engineering Research Team
2010	Proposal Reviewer National Science Foundation
2010	Top Reviewer Recognition. *Journal of Pharmaceutical Sciences*

JOURNAL REVIEWER:

AAPS PharmSciTech
Critical Reviews in Therapeutic Drug Carrier Systems
Crystal Growth and Design
Environmental Science and Technology
European Journal of Pharmaceutics and Biopharmaceutics
Industrial & Engineering Chemistry Research
International Journal of Pharmaceutics
Journal of Chemical and Engineering Data
Journal of Controlled Release
Journal of Food and Agricultural Sciences
Journal of Pharmaceutical Innovation
Journal of Pharmaceutical Sciences
Journal of Physical Chemistry
Journal of Thermal Analysis and Calorimetry
Journal of Solution Chemistry
Journal of the Air and Waste Management Association
Molecular Pharmaceutics
Pharmaceutical Development and Technology
Pharmaceutical Research
Pharmaceutics
Thermochimica Acta

PUBLICATIONS:

M.T. Carvajal and R. Pinal Review on the biopharmaceutical aspects of three anticonvulsants: Carbamazepine, Clonazepam and Nitrazepam. B.S. Thesis. National University of Mexico, Mexico 1984.

R. Pinal and S.H. Yalkowsky, Solubility and partitioning VII. Solubility of barbiturates in water. *J. Pharm. Sci.*, **76**, 75-85 (1987).

M. Chawla, R. Pinal, K.R. Morris and S.H. Yalkowsky, Cosolvency I. Some non-hydrogen bonding solutes with non-hydrogen bonding solvents. *Tox. Env. Chem.*, **15**, 237-247 (1987).

S.H. Yalkowsky, R. Pinal and S. Banerjee, Water Solubility: A critique of the solvatochromic approach. *J. Pharm. Sci.*, **77**, 74-77 (1988).

R. Pinal and S.H. Yalkowsky, Solubility and partitioning IX. Solubility of hydantoins in water. *J. Pharm. Sci.*, **77**, 518-522 (1988).

K.R. Morris, R. Abramowitz, R. Pinal, P. Davis and S.H. Yalkowsky, Solubility of aromatic pollutants in mixed solvents. *Chemosphere*, **17**, 285-298 (1988).

R. Pinal, L.S. Lee, P.V. Cline, and P.S.C. Rao, Solubility and sorption of organic contaminants in complex mixtures: Implications on contaminant release and mobilization at a waste disposal site. In *Proceedings: Environmental Research Conference on Groundwater Quality and Waste Disposal*. Electric Power Research Institute, Palo Alto, CA 1990, Chap. 23.

R. Pinal, P.S.C. Rao, L.S. Lee, P.V. Cline, and S.H. Yalkowsky, Cosolvency of partially-miscible organic solvents on the solubility of hydrophobic organic chemicals. *Environ. Sci. Technol.*, **24**, 639-647 (1990).

P.S.C. Rao, L.S. Lee and R. Pinal, Cosolvency and sorption of hydrophobic organic chemicals. *Environ. Sci. Technol.*, **24**, 647-654 (1990).

R. Pinal, P.S.C. Rao and L.S. Lee, Prediction of the solubility of hydrophobic compounds in non-ideal solvent mixtures. *Chemosphere*, **22**, 939-951 (1991).

L.S. Lee, C.A. Bellin, R. Pinal, and P.S.C. Rao, Cosolvent effects on sorption of organic acids by soils from mixed solvents. *Environ. Sci. Technol,* **27**, 165-71 (1993).

S.H. Yalkowsky and R. Pinal, Estimation of the aqueous solubility of complex organic compounds. *Chemosphere,* **26**, 1239-61 (1993).

R. Pinal, Effect of molecular symmetry on melting temperature and solubility. *Org. Biomol. Chem.* **2**, 2692-2699 (2004).

R. Pinal. Drug Bioavailability. Estimation of Solubility, Permeability, Absorption and Bioavailability by H. van de Waterbeemd, H. Lennernas, and P. Artursson. *Pharm. Res.* **21**, 1067-1069 (2004).

C. Mao, R. Pinal and K.R. Morris, A quantitative model to evaluate solubility relationship of polymorphs from their thermal properties. *Pharm. Res*. **22**, 1151-1157 (2005).

Z. Qiu, J.G. Stowell, K.R. Morris, S.R. Byrn and R. Pinal, Kinetic study of the Maillard reaction between metoclopramide hydrochloride and lactose. *Int. J. Pharm.* **303**, 20-30 (2005).

M.T. Carvajal, S.P. Chamarthy, A. Otte, and R. Pinal, Influence Of Residual Water on the Surface Functionality of Powdered Materials, in *Proceedings of Respiratory Drug Delivery X (2006)*, Richard N. Dalby, Peter R. Byron, and J. Peart, eds., Interpharm Press, Buffalo Grove, Illinois. p. 757-760.

C. Mao, S. P. Chamarthy and R. Pinal, A calorimetric method to estimate molecular mobility of amorphous solids at relatively low temperatures. *Pharm. Res.* **23**, 1906-1917 (2006)

C. Mao, S. P. Chamarthy S.R. Byrn and R. Pinal, Time-dependence of molecular mobility during structural relaxation and its impact on organic amorphous solids: an investigation based on a calorimetric approach. *Pharm. Res*. **23**, 1906-1917 (2006).

S. P. Chamarthy and R. Pinal. Moisture induced antiplasticization in microcrystalline cellulose compacts. *Tablets and Capsules*, **5**, 22-33 (2007).

C. Mao, S. P. Chamarthy and R. Pinal. Calorimetric study and modeling of molecular mobility in amorphous organic pharmaceutical compounds using a modified Adam-Gibbs approach. *J. Phys. Chem. B.* **111**, 13243-13252 (2007).

J. L. P. Soh, N. Boersen, M. T. Carvajal, K. R. Morris, G. E. Peck and R. Pinal. Importance of raw material attributes for modeling ribbon and granule properties in roller compaction: Multivariate analysis on roll gap and NIR spectral slope as process critical control parameters. *J. Pharm. Innov.*, **2**, 106-124 (2007).

T. Feng, R. Pinal and M.T. Carvajal. Process induced disorder in crystalline materials: differentiating defective crystals from the amorphous form of griseofulvin. *J. Pharm. Sci.*, DOI: 10.1002/jps.21219 (2007).

Y. Miyako, H. Tai, K. Ikeda, R. Kume and R. Pinal. Solubility screening on a series of structurally related compounds. Cosolvent-induced changes on the activity coefficient of hydrophobic solutes. *Drug Dev. Ind. Pharm*. **34**, 499-505 (2008).

M. Papp, C. P. Pujara, and R. Pinal. Monitoring of high-shear granulation using acousticemission: Predicting granule properties. *J. Pharm. Innov.* **3**, 113-122 (2008).

T. Feng, F. Wang, R. Pinal, C. Wassgren and M. T. Carvajal. Investigation of the variability of NIR in-line monitoring of roller compaction process by using Fast Fourier Transform (FFT) analysis. *AAPS Pharm SciTech*, **90**, 419-424 (2008).

R. Pinal. Entropy of mixing and the glass transition of amorphous mixtures. *Entropy*, **10**, 207-223 (2008).

S. P. Chamarthy and R. Pinal. Plasticizer concentration and the performance of polymeric drug delivery systems. *Colloids Surf. A*, **331**, 25-30 (2008).

S.P. Chamarthy and R. Pinal. The nature of crystal disorder in milled pharmaceutical materials. *Colloids Surf. A*, **331**, 68-75 (2008).

J.L.P. Soh, F. Wang, N. Boersen, R. Pinal, G.E. Peck, M.T. Carvajal, J. Cheney, H. Valthorsson, and J. Pazdan. Utility of multivariate analysis in modeling the effects of raw material properties and operating parameters on granule and ribbon properties prepared in roller compaction. *Drug Dev. Ind. Pharm*. **34**, 1022-1035 (2008).

S. P. Chamarthy, R. Pinal, and M. T. Carvajal. Elucidating raw material variability - Importance of surface properties and functionality in pharmaceutical powders. *AAPS PharmSciTech*, **10**, 780-788 (2009).

Y. Miyako, Y. Zhao, K. Takeshima, T. Kataoka, T. Handa, and R. Pinal. Solubility of hydrophobic compounds in water–cosolvent mixtures: relation of solubility with water–cosolvent interactions. *J. Pharm. Sci.*, **99**, 293-302 (2009).

S. P. Chamarthy, N. Khalef, N. Trasi, A. Bakri, M. T. Carvajal, and R. Pinal. The effect of dehydration conditions on the functionality of anhydrous amorphous raffinose. *Eur. J. Pharm. Sci.*, **40**, 171-178 (2010).

N. Khalef, R. Pinal, and A. Bakri. Limitations of amorphous content quantification by isothermal calorimetry using saturated salt solutions to control relative humidity: alternative methods. *J. Pharm. Sci.*, **99**, 2080-2089 (2010).

C. Mao, S. P. Chamarthy, S. R. Byrn, and R. Pinal. Theoretical and experimental considerations on the enthalpic relaxation of organic glasses using differential scanning calorimetry. *J. Phys. Chem. B*, **114**, 269–279 (2010).

Y. Miyako, N. Khalef, K. Matsuzaki, and R. Pinal. Solubility enhancement of hydrophobic compounds by cosolvents: Role of solute hydrophobicity on the solubilization effect. *Int. J. Pharm.*, **393**, 48-54 (2010).

J.-Y. Kim, S. Kim, M. Papp, K. Park, and R. Pinal. Hydrotropic solubilization of poorly water-soluble drugs. *J. Pharm. Sci.*, In press (2010).

A. Zarow, B. Zhou, X. Wang, R. Pinal and Z. Iqbal. Spectroscopic and X-ray diffraction study of structural disorder in cryomilled and amorphous griseofulvin. *Appl. Spectroscopy* **65**, 135-143 (2010).

M. Thommes, D. R. Ely, M. T. Carvajal and R. Pinal. Improvement of the dissolution rate of poorly soluble drugs by solid crystal suspensions. *Mol. Pharmaceutics* **8**: 727-735 (2011)

BOOK CHAPTERS

S. P. Chamarthy, F. X. Diringer, and R. Pinal. The plasticization-antiplasticization threshold of water in microcrystalline cellulose. A perspective based on bulk free volume. In: *Water Properties in Food, Health, Pharmaceutical and Biological Systems: ISOPOW 10*. D. Reid, T. Sajjaanantakul, P. J. Lillford, and S. Charoenrein, eds, Willey-Blackwell, Ames, Iowa, USA, 2010, Chapter 23.

S. P. Chamarthy and R. Pinal. Another unusual property of water: It increases the glass transition temperature of a glassy polymer. In: *Water Properties in Food, Health, Pharmaceutical and Biological Systems: ISOPOW 10*. D. Reid, T. Sajjaanantakul, P. J. Lillford, and S. Charoenrein, eds, Wiley-Blackwell, Ames, Iowa, USA, 2010, Chapter 29.

PATENTS

M. Thommes, R. Pinal and T.M. Carvajal. Solid Formulations of Crystalline Compounds. PCT/US2008/080327 (WO/2009/052391)

LECTURES:

R. Pinal and S. H. Yalkowsky. Solubility of anticonvulsants in water. American Association of Pharmaceutical Scientists. Annual Meeting, Boston, Massachusetts 1987.

R. Pinal, L.S. Lee, and P.S.C. Rao. Solubility and sorption of hydrophobic organic chemicals: Cosolvency of partially miscible organic solvents. American Chemical Society. National Meeting, Miami, Florida, 1989.

R. Pinal, P.V. Cline, L.S. Lee and P.S.C. Rao. Solubility and sorption of organic contaminants in complex mixtures. Environmental Research Conference. EPRI/U.S. EPA Washington DC, 1989.

R. Pinal. Solubility and sorption of hydrophobic compounds in non ideal solvent mixtures. School of Pharmacy, University of Pittsburgh, Pittsburgh, Pennsylvania, 1991.

R. Pinal. Cosolvency and Solubility. Workshop on the environmental behavior of complex mixtures. University of Arizona, Tucson, Arizona, 1991.

R. Pinal. Solubility issues during candidate selection - Case studies. American Association of Pharmaceutical Scientists. Southeastern Regional Meeting, Research Triangle Park, North Carolina, 1996.

R. Pinal. Importance of drug substance characterization – Formulation challenges. American Association of Pharmaceutical Scientists. National Meeting, New Orleans, Louisiana, 1999.

R. Pinal. Physical characterization of an amorphous formulation. College of Pharmacy, University of Michigan, Ann Arbor, Michigan, 2002.

N. Shah and R. Pinal. Amorphous formulation for improving bioavailability and storage stability and the characterization of the formulation. Pharmaceutics and Drug Delivery Conference. American Association of Pharmaceutical Scientists. Arlington, Virginia, 2002.

R. Pinal. Use of microprecipitation to improve the oral bioavailability of a very poorly soluble compound. Land-O-Lakes Pharmaceutical Conference. University of Wisconsin, Merrimac, Wisconsin, 2002.

R. Pinal. Polymorphic characterization and monitoring of a system with critical transitions in the typical range of processing and storage conditions. Polymorphism & Crystallization Conference. Banett International, Philadelphia, Pennsylvania, 2002.

R. Pinal. Approaches for liquid-form delivery of poorly soluble drugs. Department of Industrial Pharmacy, Purdue University, West Lafayette, Indiana, 2002.

R. Pinal. Melting properties and molecular symmetry. College of Pharmacy, University of Arizona, Tucson, Arizona, 2004.

P. Findlay, G. Peck, K. Morris and R. Pinal. Near-infrared spectroscopic monitoring of fluidized bed granulation: process control and control of granule strength. XI Symposium of the Chemical Engineering Department of the University of Puerto Rico at Mayaguez, Puerto Rico, 2004.

D. Lechuga and R. Pinal. Particle adhesion measurements and particle interactions. American Association of Pharmaceutical Scientists. 40th Annual Pharmaceutical Conference at Arden House. Harriman, New York, 2005.

R. Pinal. Structural and isomeric effects on the solubility of organic compounds. The NRL (National Research Laboratory) Symposium of Pharmaceutical Technology for Bioactives Delivery. College of Pharmacy, Chungnam National University, Daejon, Korea, 2005.

R. Pinal. Structural and isomeric effects on the solubility of organic compounds. Korea Research Institute of Chemical Technology (KRICT), Daejon, Korea, 2005.

P. Basu, K. Morris and R. Pinal. PAT and ASTM E55. Filling the blanks. 45th Annual Land O' Lakes Conference on Pharmaceutical Analysis. University of Wisconsin, Merrimack, Wisconsin, 2005.

R. Pinal. Relating theory and experiment in solid state characterization. Significance to quality by design. Roche Carolina Inc., Florence, South Carolina, 2005.

R. Pinal. The NSF I/UCRC Dane O. Kilsig Center for Pharmaceutical Processing Research. Intra-University Pharmaceutical Technology & Education Workshop. Purdue University, West Lafayette, Indiana, 2006.

R. Pinal. Research Initiatives at the Dane O. Kildsig Center for Pharmaceutical Processing Research. USP and Pharmaceutical Research Centers. United States Pharmacopeia, Headquarters, Rockville Maryland, 2006.

R. Pinal. Assessment of molecular mobility in amorphous pharmaceutical materials. Setaram Instrumentation, Headquarters, Lyon, France, 2006.

R. Pinal, C. Mao and S. P. Chamarthy. Time-dependence of Molecular Mobility During Structural Relaxation in Amorphous Organic Solids - A Calorimetric Approach. Amorph2006. Churchill College, Cambridge UK, 2006.

S. P. Chamarthy, M. T. Carvajal, and R. Pinal. Moisture induced antiplasticization of microcrystalline cellulose. 13th World Congress of Food Science and Technology. International Union of Food Science and Technology, Nantes, France, 2006.

S. P. Chamarthy, D. Ely, R. Pinal, and M. T. Carvajal. Understanding the surface of pharmaceutical powders and its effectiveness in functionality. APS Inhalation 2007. University of Bath, Bath, UK, 2007.

N. K. Nere, R. Pinal, D. Ramkrishna and R. Narajan. On the sameness criteria for the particle size distributions. AIChE National Meeting. Salt Lake City, Utah, 2007.

R. Pinal. Plasticizer concentration and the performance of drug delivery systems. Formula V International Conference. DEChEMA, Potsdam, Germany, 2007.

R. Pinal. Assessment of the time- and temperature-dependence of molecular mobility during structural relaxation in amorphous organic solids. School of Pharmacy, University of Kentucky, 2007.

R. Pinal. Stability of amorphous solids. Its relationship to molecular mobility. 9th International Workshop on Physical Characterization of Pharmaceutical Solids. ASSA International, Boston, Massachusetts, 2007.

R. Pinal. The plasticization-antiplasticization threshold of water in carbohydrate polymers. A perspective based on free volume. ISOPOW 10. Kasetsart University, Bangkok, Thailand, 2007.

R. Pinal. Controlled release of active compounds in pharmaceutical science. ISOPOW Practicum III. Kasetsart University, Bangkok, Thailand, 2007.

R. Pinal. Characterization and stability of amorphous systems. Hoffmann-La Roche Inc., Nutley, New Jersey, 2007.

R. Pinal. Modeling structural relaxation in glassy pharmaceutical materials. ERC Seminar, School of Chemical Engineering, Purdue University, 2007.

R. Pinal. Bioavailability and stability, the respective benefit and challenge of the amorphous formulation of poorly soluble drugs, International Colloquium on Challenges and Innovation in Pharmaceutical Research. University of Morelos, Cuernavaca, Mexico, 2008.

R. Pinal. Time and temperature dependence of molecular mobility during structural relaxation in amorphous organic solids. Abbott Laboratories, North Chicago, Illinois, 2008.

R. Pinal. Effects of plasticizers on the physical and mechanical properties of pharmaceutical polymers. Genentech Inc., South San Francisco, California, 2008.

R. Pinal. Solubilization by cosolvents. College of Pharmacy, University of Arizona, Tucson, Arizona, 2008.

R. Pinal, S. P. Chamarthy, R. A. Shmeis, G. Etherington, and P. Le Parlouer. Differentiating surface and bulk properties of solids in relation to functionality. 10th International Workshop on the Physical Characerization of Pharmaceutical Solids. ASSA International, Bamberg, Germany, 2008.

R. Pinal. Solubility and solubilization of drugs. Faculty of Superior Studies, National University of Mexico, Cuautitlan-Izcalli, Mexico, 2008.

R. Pinal. Lecture Series on Drug Solubility. Faculty of Pharmacy. Louis Pasteur University, Strasbourg, France, 2008.

R. Pinal. Lecture Series on Drug Solubility. School of Pharmacy. Joseph Fourier University, Grenoble, France, 2008.

R. Pinal. Antiplasticization in pharmaceutical systems. Generality of a phenomenon observable from the structural relaxation to the mechanical and diffusion properties of polymers. School of Pharmacy. Joseph Fourier University, Grenoble, France, 2008.

R. Pinal. Antiplasticization in pharmaceutical systems. Generality of a phenomenon observable from the structural relaxation to the mechanical and diffusion properties of polymers. Institute of Pharmaceutics and Biopharmaceutics, University of Düsseldorf, Düsseldorf, Germany, 2008.

R. Pinal. Practical considerations on the use of plasticizers in pharmaceutical formulations. Faculty of Pharmacy. Louis Pasteur University, Strasbourg, France, 2008.

R. Pinal. Analogy between isomerism and polymorphism on the solubility of organic compounds. Indo-US Bilateral Workshop. Pharmaceutical co-crystals and polymorphs. Indo-US Science & Technology Forum. Mysore, India, 2009.

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