

Michael J Pikal

List of Publications by Year in Descending Order

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The third column is the impact factor (IF) of the journal, and the fourth column is the number of citations of the article.

128
papers

9,559
citations

55
h-index

95
g-index

130
ext. papers

10,260
ext. citations

4.2
avg, IF

6.32
L-index

#	Paper	IF	Citations
128	Stability of Freeze-Dried Protein Formulations: Contributions of Ice Nucleation Temperature and Residence Time in the Freeze-Concentrate. <i>Journal of Pharmaceutical Sciences</i> , 2020 , 109, 1896-1904	3.9	18
127	Evaluation of Predictors of Protein Relative Stability Obtained by Solid-State Hydrogen/Deuterium Exchange Monitored by FTIR. <i>Pharmaceutical Research</i> , 2020 , 37, 168	4.5	0
126	THE FREEZE DRYING PROCESS 2019 , 293-309		
125	Applications of the Tunable Diode Laser Absorption Spectroscopy: In-Process Estimation of Primary Drying Heterogeneity and Product Temperature During Lyophilization. <i>Journal of Pharmaceutical Sciences</i> , 2019 , 108, 416-430	3.9	6
124	Freezing of Aqueous Solutions and Chemical Stability of Amorphous Pharmaceuticals: Water Clusters Hypothesis. <i>Journal of Pharmaceutical Sciences</i> , 2019 , 108, 36-49	3.9	13
123	Effect of Controlled Ice Nucleation on Stability of Lactate Dehydrogenase During Freeze-Drying. <i>Journal of Pharmaceutical Sciences</i> , 2018 , 107, 824-830	3.9	26
122	Impact of Natural Variations in Freeze-Drying Parameters on Product Temperature History: Application of Quasi Steady-State Heat and Mass Transfer and Simple Statistics. <i>AAPS PharmSciTech</i> , 2018 , 19, 2828-2842	3.9	11
121	Modeling the Secondary Drying Stage of Freeze Drying: Development and Validation of an Excel-Based Model. <i>Journal of Pharmaceutical Sciences</i> , 2017 , 106, 779-791	3.9	13
120	Lyophilized Drug Product Cake Appearance: What Is Acceptable?. <i>Journal of Pharmaceutical Sciences</i> , 2017 , 106, 1706-1721	3.9	96
119	Dynamics in Polysaccharide Glasses and Their Impact on the Stability of Encapsulated Flavors. <i>Food Biophysics</i> , 2016 , 11, 20-33	3.2	6
118	Influence of Miscibility of Protein-Sugar Lyophilizates on Their Storage Stability. <i>AAPS Journal</i> , 2016 , 18, 1225-1232	3.7	28
117	Addition of Amino Acids to Further Stabilize Lyophilized Sucrose-Based Protein Formulations: I. Screening of 15 Amino Acids in Two Model Proteins. <i>Journal of Pharmaceutical Sciences</i> , 2016 , 105, 697-704	3.9	39
116	Addition of Monovalent Electrolytes to Improve Storage Stability of Freeze-Dried Protein Formulations. <i>Journal of Pharmaceutical Sciences</i> , 2016 , 105, 530-541	3.9	11
115	Protein Internal Dynamics Associated With Pre-System Glass Transition Temperature Endothermic Events: Investigation of Insulin and Human Growth Hormone by Solid State Hydrogen/Deuterium Exchange. <i>Journal of Pharmaceutical Sciences</i> , 2016 , 105, 3290-3295	3.9	5
114	Freeze-Drying Process Development and Scale-Up: Scale-Up of Edge Vial Versus Center Vial Heat Transfer Coefficients, K. <i>Journal of Pharmaceutical Sciences</i> , 2016 , 105, 3333-3343	3.9	37
113	Stabilization of proteins in solid form. <i>Advanced Drug Delivery Reviews</i> , 2015 , 93, 14-24	18.5	107
112	Lyophilization of Therapeutic Proteins in Vials: Process Scale-Up and Advances in Quality by Design 2015 , 121-156		1

111	Optimization of a Raman microscopy technique to efficiently detect amorphous-amorphous phase separation in freeze-dried protein formulations. <i>Journal of Pharmaceutical Sciences</i> , 2014 , 103, 2749-2758	3.9	9
110	Characterization of dynamics in complex lyophilized formulations: II. Analysis of density variations in terms of glass dynamics and comparisons with global mobility, fast dynamics, and Positron Annihilation Lifetime Spectroscopy (PALS). <i>European Journal of Pharmaceutics and Biopharmaceutics</i> , 2013 , 85, 127-33	5.7	29
109	Is the pre-Tg DSC endotherm observed with solid state proteins associated with the protein internal dynamics? Investigation of bovine serum albumin by solid state hydrogen/deuterium exchange. <i>European Journal of Pharmaceutics and Biopharmaceutics</i> , 2013 , 85, 170-6	5.7	15
108	Lyophilization process design space. <i>Journal of Pharmaceutical Sciences</i> , 2013 , 102, 3883-7	3.9	46
107	Accurate prediction of collapse temperature using optical coherence tomography-based freeze-drying microscopy. <i>Journal of Pharmaceutical Sciences</i> , 2013 , 102, 1773-1785	3.9	30
106	Investigations on polyplex stability during the freezing step of lyophilization using controlled ice nucleation--the importance of residence time in the low-viscosity fluid state. <i>Journal of Pharmaceutical Sciences</i> , 2013 , 102, 929-46	3.9	17
105	Carbon-deuterium rotational-echo double-resonance NMR spectroscopy of lyophilized aspartame formulations. <i>Journal of Pharmaceutical Sciences</i> , 2012 , 101, 283-90	3.9	6
104	Chemical stability of amorphous materials: specific and general media effects in the role of water in the degradation of freeze-dried zoniporide. <i>Journal of Pharmaceutical Sciences</i> , 2012 , 101, 3110-23	3.9	20
103	Optical coherence tomography-based freeze-drying microscopy. <i>Biomedical Optics Express</i> , 2012 , 3, 55-63	3.5	25
102	Aqueous solubility of crystalline and amorphous drugs: Challenges in measurement. <i>Pharmaceutical Development and Technology</i> , 2011 , 16, 187-200	3.4	94
101	Quality by design in formulation and process development for a freeze-dried, small molecule parenteral product: a case study. <i>Pharmaceutical Development and Technology</i> , 2011 , 16, 549-76	3.4	36
100	Emerging freeze-drying process development and scale-up issues. <i>AAPS PharmSciTech</i> , 2011 , 12, 372-8	3.9	63
99	Optimization of the secondary drying step in freeze drying using TDLAS technology. <i>AAPS PharmSciTech</i> , 2011 , 12, 379-87	3.9	27
98	Effect of sugars on the molecular motion of freeze-dried protein formulations reflected by NMR relaxation times. <i>Pharmaceutical Research</i> , 2011 , 28, 3237-47	4.5	18
97	The study of phase separation in amorphous freeze-dried systems. Part I: Raman mapping and computational analysis of XRPD data in model polymer systems. <i>Journal of Pharmaceutical Sciences</i> , 2011 , 100, 206-22	3.9	38
96	The study of amorphous phase separation in a model polymer phase-separating system using Raman microscopy and a low-temperature stage: effect of cooling rate and nucleation temperature. <i>Journal of Pharmaceutical Sciences</i> , 2011 , 100, 1362-76	3.9	20
95	The study of phase separation in amorphous freeze-dried systems, part 2: investigation of Raman mapping as a tool for studying amorphous phase separation in freeze-dried protein formulations. <i>Journal of Pharmaceutical Sciences</i> , 2011 , 100, 1467-74	3.9	25
94	High-precision absolute (true) density measurements on hygroscopic powders by gas pycnometry: application to determining effects of formulation and process on free volume of lyophilized products. <i>Journal of Pharmaceutical Sciences</i> , 2011 , 100, 2945-51	3.9	19

93	Solubility advantage of amorphous pharmaceuticals, part 3: Is maximum solubility advantage experimentally attainable and sustainable?. <i>Journal of Pharmaceutical Sciences</i> , 2011 , 100, 4349-56	3.9	86
92	Stabilization of Lyophilized Pharmaceuticals by Control of Molecular Mobility: Impact of Thermal History 2010 , 521-548		1
91	Determination of end point of primary drying in freeze-drying process control. <i>AAPS PharmSciTech</i> , 2010 , 11, 73-84	3.9	175
90	Solubility advantage of amorphous pharmaceuticals: II. Application of quantitative thermodynamic relationships for prediction of solubility enhancement in structurally diverse insoluble pharmaceuticals. <i>Pharmaceutical Research</i> , 2010 , 27, 2704-14	4.5	156
89	Solubility advantage of amorphous pharmaceuticals: I. A thermodynamic analysis. <i>Journal of Pharmaceutical Sciences</i> , 2010 , 99, 1254-64	3.9	286
88	The impact of thermal treatment on the stability of freeze dried amorphous pharmaceuticals: I. Dimer formation in sodium ethacrylate. <i>Journal of Pharmaceutical Sciences</i> , 2010 , 99, 663-82	3.9	17
87	The impact of thermal treatment on the stability of freeze-dried amorphous pharmaceuticals: II. Aggregation in an IgG1 fusion protein. <i>Journal of Pharmaceutical Sciences</i> , 2010 , 99, 683-700	3.9	37
86	Freeze-drying in novel container system: Characterization of heat and mass transfer in glass syringes. <i>Journal of Pharmaceutical Sciences</i> , 2010 , 99, 3188-204	3.9	18
85	The effect of dryer load on freeze drying process design. <i>Journal of Pharmaceutical Sciences</i> , 2010 , 99, 4363-79	3.9	35
84	Prediction of onset of crystallization in amorphous pharmaceutical systems: phenobarbital, nifedipine/PVP, and phenobarbital/PVP. <i>Journal of Pharmaceutical Sciences</i> , 2010 , 99, 3887-900	3.9	46
83	Choked flow and importance of Mach I in freeze-drying process design. <i>Chemical Engineering Science</i> , 2010 , 65, 5716-5727	4.4	62
82	The glass transition and sub-T(g)-relaxation in pharmaceutical powders and dried proteins by thermally stimulated current. <i>Journal of Pharmaceutical Sciences</i> , 2009 , 98, 81-93	3.9	18
81	Solid state chemistry of proteins IV. What is the meaning of thermal denaturation in freeze dried proteins?. <i>Journal of Pharmaceutical Sciences</i> , 2009 , 98, 1387-99	3.9	9
80	Non-invasive product temperature determination during primary drying using tunable diode laser absorption spectroscopy. <i>Journal of Pharmaceutical Sciences</i> , 2009 , 98, 3406-18	3.9	41
79	Impact of sucrose level on storage stability of proteins in freeze-dried solids: I. Correlation of protein-sugar interaction with native structure preservation. <i>Journal of Pharmaceutical Sciences</i> , 2009 , 98, 3131-44	3.9	54
78	Impact of sucrose level on storage stability of proteins in freeze-dried solids: II. Correlation of aggregation rate with protein structure and molecular mobility. <i>Journal of Pharmaceutical Sciences</i> , 2009 , 98, 3145-66	3.9	82
77	Mechanisms of protein stabilization in the solid state. <i>Journal of Pharmaceutical Sciences</i> , 2009 , 98, 2886-908	3.9	202
76	Reduced pressure ice fog technique for controlled ice nucleation during freeze-drying. <i>AAPS PharmSciTech</i> , 2009 , 10, 1406-11	3.9	67

75	Study of the individual contributions of ice formation and freeze-concentration on isothermal stability of lactate dehydrogenase during freezing. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 798-814	3.9	87
74	The impact of drying method and formulation on the physical properties and stability of methionyl human growth hormone in the amorphous solid state. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 163-84	3.9	53
73	Role of thermodynamic, molecular, and kinetic factors in crystallization from the amorphous state. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 1329-49	3.9	328
72	Prediction of onset of crystallization from experimental relaxation times. II. Comparison between predicted and experimental onset times. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 455-72	3.9	63
71	Effects of annealing on enthalpy relaxation in lyophilized disaccharide formulations: mathematical modeling of DSC curves. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 3084-99	3.9	16
70	Investigation of the impact of annealing on global molecular mobility in glasses: optimization for stabilization of amorphous pharmaceuticals. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 3865-82	3.9	30
69	Correlation between molecular mobility and crystal growth of amorphous phenobarbital and phenobarbital with polyvinylpyrrolidone and L-proline. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 3830-41	3.9	33
68	Role of mechanical stress in crystallization and relaxation behavior of amorphous indomethacin. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 4446-58	3.9	54
67	Solid state ¹³ C NMR investigation of impact of annealing in lyophilized glasses. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 4336-46	3.9	13
66	Different measures of molecular mobility: comparison between calorimetric and thermally stimulated current relaxation times below T _g and correlation with dielectric relaxation times above T _g . <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 4498-515	3.9	20
65	Solid state chemistry of proteins: II. The correlation of storage stability of freeze-dried human growth hormone (hGH) with structure and dynamics in the glassy solid. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 5106-21	3.9	80
64	Solid state stability of proteins III: calorimetric (DSC) and spectroscopic (FTIR) characterization of thermal denaturation in freeze dried human growth hormone (hGH). <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 5122-31	3.9	31
63	Correlation of annealing with chemical stability in lyophilized pharmaceutical glasses. <i>Journal of Pharmaceutical Sciences</i> , 2008 , 97, 5240-51	3.9	34
62	Protein stability during freezing: separation of stresses and mechanisms of protein stabilization. <i>Pharmaceutical Development and Technology</i> , 2007 , 12, 505-23	3.4	301
61	Investigation of drying stresses on proteins during lyophilization: differentiation between primary and secondary-drying stresses on lactate dehydrogenase using a humidity controlled mini freeze-dryer. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 61-70	3.9	36
60	Evaluation of tunable diode laser absorption spectroscopy for in-process water vapor mass flux measurements during freeze drying. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 1776-93	3.9	105
59	Simultaneous measurement of water desorption isotherm and heats of water desorption of proteins using perfusion isothermal microcalorimetry. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 1974-82	3.9	9
58	The challenge of drying method selection for protein pharmaceuticals: product quality implications. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 1886-916	3.9	119

57	Drying-induced variations in physico-chemical properties of amorphous pharmaceuticals and their impact on stability (I): stability of a monoclonal antibody. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 1983-2008	3.9	90
56	Impact of critical process and formulation parameters affecting in-process stability of lactate dehydrogenase during the secondary drying stage of lyophilization: a mini freeze dryer study. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 2242-50	3.9	19
55	Effect of hydration on the secondary structure of lyophilized proteins as measured by fourier transform infrared (FTIR) spectroscopy. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 2910-21	3.9	26
54	Prediction of the onset of crystallization of amorphous sucrose below the calorimetric glass transition temperature from correlations with mobility. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 1258-69	3.9	66
53	The effect of annealing on the stability of amorphous solids: chemical stability of freeze-dried moxalactam. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 1237-50	3.9	43
52	Solid state chemistry of proteins: I. glass transition behavior in freeze dried disaccharide formulations of human growth hormone (hGH). <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 2765-76	3.9	39
51	Use of manometric temperature measurement (MTM) and SMART freeze dryer technology for development of an optimized freeze-drying cycle. <i>Journal of Pharmaceutical Sciences</i> , 2007 , 96, 3402-18	3.9	49
50	Drying-induced variations in physico-chemical properties of amorphous pharmaceuticals and their impact on Stability II: stability of a vaccine. <i>Pharmaceutical Research</i> , 2007 , 24, 715-27	4.5	82
49	Using modulated DSC to investigate the origin of multiple thermal transitions in frozen 10% sucrose solutions. <i>Thermochimica Acta</i> , 2006 , 444, 141-147	2.9	29
48	Evaluation of manometric temperature measurement, a process analytical technology tool for freeze-drying: part I, product temperature measurement. <i>AAPS PharmSciTech</i> , 2006 , 7, E14	3.9	43
47	Heat and mass transfer scale-up issues during freeze-drying, III: Control and characterization of dryer differences via operational qualification tests. <i>AAPS PharmSciTech</i> , 2006 , 7, E61-E70	3.9	57
46	Heat and mass transfer scale-up issues during freeze-drying, III: control and characterization of dryer differences via operational qualification tests. <i>AAPS PharmSciTech</i> , 2006 , 7, E39	3.9	63
45	Evaluation of manometric temperature measurement, a process analytical technology tool for freeze-drying: part II measurement of dry-layer resistance. <i>AAPS PharmSciTech</i> , 2006 , 7, 93	3.9	29
44	Evaluation of manometric temperature measurement (MTM), a process analytical technology tool in freeze drying, part III: heat and mass transfer measurement. <i>AAPS PharmSciTech</i> , 2006 , 7, 97	3.9	38
43	Predictions of onset of crystallization from experimental relaxation times I-correlation of molecular mobility from temperatures above the glass transition to temperatures below the glass transition. <i>Pharmaceutical Research</i> , 2006 , 23, 2277-90	4.5	58
42	Coupling between chemical reactivity and structural relaxation in pharmaceutical glasses. <i>Pharmaceutical Research</i> , 2006 , 23, 2254-68	4.5	86
41	Cake shrinkage during freeze drying: a combined experimental and theoretical study. <i>Pharmaceutical Development and Technology</i> , 2005 , 10, 33-40	3.4	56
40	Reliable determination of freeze-concentration using DSC. <i>Thermochimica Acta</i> , 2005 , 425, 149-163	2.9	24

39	Calorimetric investigation of the structural relaxation of amorphous materials: evaluating validity of the methodologies. <i>Journal of Pharmaceutical Sciences</i> , 2005 , 94, 948-65	3.9	115
38	Post-thaw aging affects activity of lactate dehydrogenase. <i>Journal of Pharmaceutical Sciences</i> , 2005 , 94, 1382-8	3.9	19
37	Effect of sorbitol and residual moisture on the stability of lyophilized antibodies: Implications for the mechanism of protein stabilization in the solid state. <i>Journal of Pharmaceutical Sciences</i> , 2005 , 94, 1445-55	3.9	138
36	Mechanism of protein stabilization by sugars during freeze-drying and storage: native structure preservation, specific interaction, and/or immobilization in a glassy matrix?. <i>Journal of Pharmaceutical Sciences</i> , 2005 , 94, 1427-44	3.9	318
35	Freeze-drying process design by manometric temperature measurement: design of a smart freeze-dryer. <i>Pharmaceutical Research</i> , 2005 , 22, 685-700	4.5	136
34	The effect of stabilizers and denaturants on the cold denaturation temperatures of proteins and implications for freeze-drying. <i>Pharmaceutical Research</i> , 2005 , 22, 1167-75	4.5	86
33	Measurement of the kinetics of protein unfolding in viscous systems and implications for protein stability in freeze-drying. <i>Pharmaceutical Research</i> , 2005 , 22, 1176-85	4.5	50
32	Heat and mass transfer scale-up issues during freeze drying: II. Control and characterization of the degree of supercooling. <i>AAPS PharmSciTech</i> , 2004 , 5, e58	3.9	162
31	Design of freeze-drying processes for pharmaceuticals: practical advice. <i>Pharmaceutical Research</i> , 2004 , 21, 191-200	4.5	609
30	Evaluation of glassy-state dynamics from the width of the glass transition: results from theoretical simulation of differential scanning calorimetry and comparisons with experiment. <i>Journal of Pharmaceutical Sciences</i> , 2004 , 93, 981-94	3.9	35
29	Freeze-drying of mannitol-trehalose-sodium chloride-based formulations: the impact of annealing on dry layer resistance to mass transfer and cake structure. <i>Pharmaceutical Development and Technology</i> , 2004 , 9, 85-95	3.4	77
28	Heat and mass transfer scale-up issues during freeze-drying, I: atypical radiation and the edge vial effect. <i>AAPS PharmSciTech</i> , 2003 , 4, E14	3.9	122
27	Dynamics of pharmaceutical amorphous solids: the study of enthalpy relaxation by isothermal microcalorimetry. <i>Journal of Pharmaceutical Sciences</i> , 2002 , 91, 1853-62	3.9	121
26	Thermophysical properties of pharmaceutically compatible buffers at sub-zero temperatures: implications for freeze-drying. <i>Pharmaceutical Research</i> , 2002 , 19, 195-201	4.5	57
25	A spectroscopic investigation of hydrogen bond patterns in crystalline and amorphous phases in dihydropyridine calcium channel blockers. <i>Pharmaceutical Research</i> , 2002 , 19, 477-83	4.5	119
24	The effect of temperature on hydrogen bonding in crystalline and amorphous phases in dihydropyridine calcium channel blockers. <i>Pharmaceutical Research</i> , 2002 , 19, 484-90	4.5	55
23	Effect of initial buffer composition on pH changes during far-from-equilibrium freezing of sodium phosphate buffer solutions. <i>Pharmaceutical Research</i> , 2001 , 18, 90-7	4.5	126
22	The role of electroosmotic flow in transdermal iontophoresis. <i>Advanced Drug Delivery Reviews</i> , 2001 , 46, 281-305	18.5	240

21	Freeze drying properties of some oligonucleotides. <i>Pharmaceutical Development and Technology</i> , 2001 , 6, 151-7	3.4	4
20	Interpretation of relaxation time constants for amorphous pharmaceutical systems. <i>Journal of Pharmaceutical Sciences</i> , 2000 , 89, 417-27	3.9	116
19	Interpretation of relaxation time constants for amorphous pharmaceutical systems. <i>Journal of Pharmaceutical Sciences</i> , 2000 , 89, 417	3.9	84
18	Characterization of the Time Scales of Molecular Motion in Pharmaceutically Important Glasses. <i>Journal of Physical Chemistry B</i> , 1999 , 103, 4113-4121	3.4	304
17	A pragmatic test of a simple calorimetric method for determining the fragility of some amorphous pharmaceutical materials. <i>Pharmaceutical Research</i> , 1998 , 15, 762-7	4.5	57
16	The stability of insulin in crystalline and amorphous solids: observation of greater stability for the amorphous form. <i>Pharmaceutical Research</i> , 1997 , 14, 1379-87	4.5	122
15	Rational design of stable lyophilized protein formulations: some practical advice. <i>Pharmaceutical Research</i> , 1997 , 14, 969-75	4.5	514
14	Freeze-Drying of Proteins. <i>ACS Symposium Series</i> , 1994 , 120-133	0.4	89
13	The role of electroosmotic flow in transdermal iontophoresis. <i>Advanced Drug Delivery Reviews</i> , 1992 , 9, 201-237	18.5	111
12	Study of the mechanisms of flux enhancement through hairless mouse skin by pulsed DC iontophoresis. <i>Pharmaceutical Research</i> , 1991 , 8, 365-9	4.5	27
11	The effects of formulation variables on the stability of freeze-dried human growth hormone. <i>Pharmaceutical Research</i> , 1991 , 8, 427-36	4.5	222
10	Transport mechanisms in iontophoresis. III. An experimental study of the contributions of electroosmotic flow and permeability change in transport of low and high molecular weight solutes. <i>Pharmaceutical Research</i> , 1990 , 7, 222-9	4.5	94
9	Transport mechanisms in iontophoresis. I. A theoretical model for the effect of electroosmotic flow on flux enhancement in transdermal iontophoresis. <i>Pharmaceutical Research</i> , 1990 , 7, 118-26	4.5	104
8	Transport mechanisms in iontophoresis. II. Electroosmotic flow and transference number measurements for hairless mouse skin. <i>Pharmaceutical Research</i> , 1990 , 7, 213-21	4.5	105
7	The collapse temperature in freeze drying: Dependence on measurement methodology and rate of water removal from the glassy phase. <i>International Journal of Pharmaceutics</i> , 1990 , 62, 165-186	6.5	224
6	Stability testing of pharmaceuticals by high-sensitivity isothermal calorimetry at 25°C: cephalosporins in the solid and aqueous solution states. <i>International Journal of Pharmaceutics</i> , 1989 , 50, 233-252	6.5	83
5	A test of the onsager reciprocal relations and a discussion of the ionic isothermal vector transport coefficients l_{ij} for aqueous AgNO_3 at 25°C. <i>Journal of Solution Chemistry</i> , 1972 , 1, 111-130	1.8	17
4	Theory of the Onsager transport coefficients l_{ij} and R_{ij} for electrolyte solutions. <i>The Journal of Physical Chemistry</i> , 1971 , 75, 3124-3134		23

- 3 Determination and comparison of Hittorf and cell transference numbers for aqueous silver nitrate solutions at 25.deg.. *The Journal of Physical Chemistry*, **1970**, 74, 1337-1344 12
- 2 Chemistry in solid amorphous matrices: Implication for biostabilization257-272 7
- 1 The Freeze-Drying Process: The Use of Mathematical Modeling in Process Design, Understanding, and Scale-Up801-817