

Table of Contents

Preface

The History of Fluoride Glasses

J. Lucas 3

Glass Forming Ability Criterion

M. Saad and M. Poulain 11

New Fluoroaluminate Glasses and Their Crystallization Tendencies and Physical-Chemical Properties

T. Izumitani, T. Yamashita, M. Tokida, K. Miura and H. Tajima 19

Glass Forming Tendency of ZrF₄-BaF₂ Systems Containing Chlorides

S. Inoue and D.R. MacFarlane 27

Incorporation Effect of Indium Fluoride in ZBLAN Heavy-Metal Fluoride Glass

P. Baniel and A. Kober 33

A New Family of Indium Based Fluoride Glasses with Broad Transmission Range and Good Stability

G. Fonteneau, A. Bouaggad and J. Lucas 41

Alkali Cadmium Halide Glasses

M. Matecki, M. Poulain and M. Poulain 47

The Structure and Properties of Infrared Transmitting Chalcohalide Glasses

J.B. Heo, J.S. Sanghera, H. Nasu and J.D. Mackenzie 55

Preparation of Glasses in the System ZnBr₂ - KBr - MBr₂ - AgBr (M / Ba, Pb)

K. Kadono, H. Nakamichi and M. Nogami 63

A New Glass Family Based on Tellurium Chalcohalides

X. Zhang, J. Lucas and G. Fonteneau 67

Chlorofluorozirconate Glasses

M. Poulain and A. Elyamani 73

Oxychloride Glasses for IR Transmitting Fibres

M.M. Ahmad and D. Holland 87

Structure of Heavy Metal Fluoride Glasses

I. Yasui and H. Inoue 103

A New Perspective on Fluorozirconate Glass Structure

C.C. Phifer and J. Lucas 111

Molecular Dynamics Simulations of Fluoride Glass Structures

J.H. Simmons, R. Faith and G. O'Rear 121

Structure of Barium Fluorozirconate Glasses: A Quasi-Crystalline Modelling of "BaZr₂F₁₀"

A. Le Bail, B. Boulard and C. Jacoboni 127

The Structure of Heavy Metal Fluoride Glasses

C.N.J. Wagner, S.B. Jost, G. Etherington and M.S. Boldrick 137

X-Ray Absorption Study of Nd³⁺ Coordination in Fluoroberyllate Glasses

M.J. Weber and J. Wong 141

NMR of Some Halide Containing Glasses

R.S. Aujla, R. Dupree, D. Holland and A.P. Kemp 147

The Structure of Vitreous NaF - DyF₃ - BeF₂: A Neutron Diffraction and Molecular Dynamics Study

A.C. Wright, A.G. Clare, G. Etherington, R.N. Sinclair, S.A. Brawer and M.J. Weber 157

F Ion Conduction Mechanism in Glasses Based on ZrF₄

H. Inoue and I. Yasui 161

Purification and Analytical Techniques for Fluoride Glass Starting Materials

R.C. Folweiler and F.X. Pink 171

Synthesis of Iron-Impurity Free ZrF₄

T. Tatsuno 181

Preparation of High Purity Zirconium Fluoride Glasses

G.G. Devyatkh, M.F. Churbanov and E.M. Dianov 187

Plasma-Assisted Removal of Surface Hydroxide from NaF	193
P.H. Klein	
Hydrogen Impurities in Halides and Oxides	195
R.C. Pastor and L.E. Gorre	
OH and H₂O in Fluoride Glasses: Determination of Molar Extinction Coefficients	203
P.S. Christensen, G. Fonteneau, J. Lucas and S. Mitachi	
Water and Oxygen Impurities and Their Removal from Fluoride Glass Starting Materials	217
W. Chen, P. Shlichta, G.F. Neilson and M.C. Weinberg	
Analysis of Ultra-Trace Fiber Impurities by Photoluminescence	221
W.J. Miniscalco, B.A. Thompson and C.F. Fisher	
Determination of Ultra-Low Impurity Concentrations in Fluoride Glass Fibers by Photoluminescence Techniques	229
J.A. Freitas, U. Strom and L. Busse	
Glass Matrix Analysis by DC Plasma	235
C.F. Fisher, I.D. Aggarwal and R.M. Rourke	
Reactive Atmosphere Processing of Fluoride Glasses	245
R.C. Pastor	
Vapor Deposition of Fluoride Glasses	253
C. Jacoboni, B. Boulard, H. Poignant and P. Baniel	
Chemical Vapor Deposition of Fluoride Glasses	259
A. Sarhangi and D.A. Thompson	
Effects of Oxide and Water Impurities in Raw Materials Upon Fluoride Glass Quality	269
W. Chen, P. Shlichta, M.C. Weinberg and G.F. Neilson	
Optical Scattering and EPR Study of ZBLAN Glass: Dependence on Preparation and Processing Methods	275
R.N. Schwartz, M. Robinson and G.L. Tangonan	
Gas Solubility in a Heavy Metal Fluoride Melt	287
J.M. Jewell and J.E. Shelby	
The Influence of Melting Conditions on the Physical Properties of Fluorozirconate Glasses	299
J.L. Grilo, M.C. Gonçalves and R.M. Almeida	
Large-Scale Melting of Fluorophosphate Optical Glasses	305
L.M. Cook, M.J. Liepmann and A.J. Marker	
Corrosion Layer Formation of ZrF₄ - Based Fluoride Glasses	315
D.G. Chen, C.J. Simmons and J.H. Simmons	
Preparation of Fluorozirconate Glass Fibers with Improved Tensile Strength	321
H.W. Schneider, A. Schoberth, A. Staudt and C. Gerndt	
Reaction of Gaseous H₂O and D₂O with ZrF₄ - Based Glasses	327
S.R. Loehr, K.H. Chung, C.T. Moynihan, G. Fonteneau, P.S. Christensen and J. Lucas	
Hermetic Coatings for Bulk Fluoride Glasses and Fibers	343
P.C. Schultz, L.J.B. Vacha, C.T. Moynihan, B.B. Harbison, K. Cadieu and R. Mossadegh	
Optical and Protective Coatings for Heavy-Metal Fluoride Glasses Prepared by Reactive Ion-Plating	353
M. Buhler, J. Edlinger, H.K. Pulker, M. Reinhold, B. Bendow and O.H. El-Bayoumi	
Recent Advances in Fluoride Glass Fiber Optics in Japan	363
T. Kanamori	
Recent Advances in Fluoride Glass Fiber Optics in the USA	375
G. Lu and I.D. Aggarwal	
Optical Loss Mechanisms in ZrF₄ Glasses and Fibres	381
P.W. France, S.F. Carter, M.W. Moore and J.R. Williams	
Physical Properties Relevant to Crucible and Preform Drawing of Fluoride Glass Fibers	387
Y. Mimura, H. Tokiwa, T. Nakai and O. Shinbori	
Viscoelastic Deformation of Fluoride Glass Fibers	393
S. Ryou, J.S. Sanghera and J.D. Mackenzie	
High Power DF Laser Delivery at 3.8 Microns Through a Fluoride Glass Fiber	403
G.I. Mazé, V. Cardin, J. Caniou, A. Scraigne and D. Monnier	
Infrared Attenuation of Thallium Bromo-Iodide Fibers	407
J.H. Goebel and B. Magilany	

Flox Fibers: Fluoride Glasses with Oxide Overclad	419
L.J.B. Vacha, P.C. Schultz, C.T. Moynihan and S.N. Crichton	
Crystallization of Fluoride Glasses	431
R.H. Doremus	
Viscosity and Crystallization of ZrF₄ - Based Glasses	435
S.N. Crichton, R. Mossadegh, C.T. Moynihan, P.K. Gupta and M.G. Drexhage	
Crystallization Kinetics in InF₃ - Based Glasses by Single and Multistep Calorimetry Techniques	443
H. Senapati and C.A. Angell	
Nucleation as a Function of Temperature in the ZrF₄ - BaF₂ Glass Forming Systems around T_g	447
D.R. MacFarlane and L.J. Moore	
Nucleation and Crystallization in a ZrF₄ - BaF₂ - LaF₃ - AlF₃ Glass	453
R. Mossadegh, S.N. Crichton and C.T. Moynihan	
The Effect of NaF on the Crystallization of ZBLAN Glasses	465
A.B. Seddon, W.A. Shah, A.G. Clare and J.M. Parker	
Chloride Doped ZBLAN Glasses	475
J.M. Parker, A.G. Clare, A.B. Seddon, J. Morris and N. Pitt	
Crystallite Formation in Fluoride Glasses	483
A.J. Drehman	
Crystallization in Large Volume Samples of Fluoride Glass	491
A.J. Bruce and J.W. Fleming	
Crystallization in a ZBLANP Core Glass and Optical Fibres	511
S.F. Carter, P.W. France, M.W. Moore and J.R. Williams	
Thermal Stability and Crystallization of Nitrogen Containing ZBYA Fluoride Glasses	515
S.H. Risbud and W.L. Vaughn	
Crystallization Kinetics of New Fluoride Glass Compositions	523
L.E. Busse, R.J. Ginther, R. Miklos and T. Izumitani	
Observation of Phase Separation in Lead Containing ZrF₄ - Based Glasses	533
L. Boehm, K.H. Chung, S.N. Crichton and C.T. Moynihan	
Phase Separation in Fluorozirconate Glasses	545
J.P. Bradley, G. Lu, C.F. Fisher and M. Robinson	
Active Optical Applications for Doped Fluoride Glasses and Fibers	553
R.C. Powell and W.A. Sibley	
Infrared to Visible Light Conversion in Rare Earth Doped Heavy Metal Fluoride Glasses	557
R.S. Quimby, M.G. Drexhage and M.J. Suscavage	
Multiphonon Relaxation and Infrared to Visible Conversion of Er³⁺ and Yb³⁺ Ions in Barium-Thorium Fluoride Glass	567
W.A. Sibley, D.C. Yeh, M.J. Suscavage and M.G. Drexhage	
Infrared Optical Transitions of Ho³⁺ Ions in Fluoride Glasses	573
J. Adam, C. Guéry, J. Lucas, J.J. Rubin, B. Moine and G. Boulon	
Energy Transfer between Manganese (II) and Lanthanides in Fluoride Glasses	581
R. Reisfeld, M. Eyal and C.K. Jorgensen	
Site Selection Spectroscopy in ZBL:Eu³⁺ Glass	585
J. Adam, J. Lucas, V. Ponçon and G. Boulon	
Local Symmetry and Optical Spectra of 3d Group Ions in Fluoride Glasses	593
C.K. Jorgensen and R. Reisfeld	
Fluorozirconate Glass Photoluminescence	597
M. Braglia, M. Ferraris, G. Grego and G. Parisi	
Time-Resolved Photoluminescence of Fe³⁺ in Fluorozirconate Glasses	603
E.S. Snow, J.A. Freitas and U. Strom	
Estimation of IR Transparency of ZnCl₂-KBr Glass by Molecular Dynamics	609
S. Inoue, M. Tamaki, H. Kawazoe and M. Yamane	
Contribution of Components of ZrF₄ - Based Glasses to IR Edge Absorption	615
K.H. Chung, C.T. Moynihan, M. Robinson and D.S. Ma	
Vibrational Characteristics and Structure of Heavy Metal Fluoride Glasses Containing Thorium and Zirconium	625
D.R. Tallant, K.J. Ward, B. Bendow, M. Poula and M. Poula	

Raman Spectra and Structure of Modified Zinc Halide Glasses	
R.M. Almeida and M.C. Silva	633
Intrinsic Rayleigh Scattering in Fluoride Glasses	
V.G. Tsoukala, J. Schroeder, G.A. Floudas and D.A. Thompson	637
Direct Electron Microscopic Observation of Continuous Scattering Centers	
G. Lu and J.P. Bradley	647
Brillouin Scattering and Phonon Attenuation in Halide and Oxide Glasses	
J. Schroeder, L.G. Hwa, M.C. Shyong, G.A. Floudas, D.A. Thompson and M.G. Drexhage	653
Effects of Neutron Irradiation on Optical Absorption in Heavy Metal Fluoride Glasses	
S.S. Mitra, P.K. Banerjee, J.M.T. Pereira and S.G. Gedam	671
Photoelastic Characteristics of Fluorozirconate and Transition-Metal Fluoride Glasses	
A. Feldman, E.R. Fuller, B. Bendow and K. Levin	681
Temperature Related Volumetric Changes in Fluorozirconate Glasses and Melts	
J.S. Sanghera, C.-. Chu and J.D. Mackenzie	685