

Contents

(Page numbers refer to the numbers at the lower margin)

Introduction 1

Opening Lecture

Broda, E.: Ludwig Boltzmann – Man, physicist, philosopher, biologist 3

Invited Papers

Huet, C.: Topics in thermodynamics of rheological behaviours 6

Giesekus, H.: A unified approach to a variety of constitutive models for polymer fluids based on the concept of configuration-dependent molecular mobility 12

Booij, H. C. and J. H. M. Palmen: Some aspects of linear and nonlinear viscoelastic behaviour of polymer melts in shear 22

Janeschitz-Kriegl, H.: Some pending problems in polymer melt rheology, as seen from the point of view of Doi’s slip-link model 34

Contributed Papers (Short Versions)

Gillings, D. W.: Herbert Freundlich – Pioneer authority in surface, colloid and rheological science: Recollections on the centenary commemorations 40

Meixner, J.: Constitutive equations of the differential type as approximations 44

Mainardi, F. and G. Turchetti: An approximation method to relate the linear viscoelastic functions 46

Weber, J. D. and A. Eberhardt: Internal state variables and normality in viscoplastic flow 49

Betten, J.: Materialgleichungen zur Beschreibung des sekundären und tertiären Kriechverhaltens anisotroper Stoffe 52

Nester, W. und K. Pöhlandt: Ermittlung von Fließkurven in verschiedenen Ausführungsformen des Stauchversuches 55

Chiem, C. Y. and J. Duffy: Strain-rate history effects and microstructural aspects in lithium fluoride and aluminium single crystals after dynamic loading 59

Jones, T. E. R. and J. M. Davies: Torsional vibrational properties of rubber cylinders 62

Boulpaep, F., A. Cardon, and C. Hiel: Dynamic methods for the determination of the viscoelastic properties of epoxy materials used for refectons of civil engineering constructions 66

Oppermann, W., K. Braatz, H. Finkelmann, W. Gleim, H. J. Kock, and G. Rehage: Viscoelastic properties of silicone polymers with liquid crystalline behaviour 69

Zachmann, H. G. and B. Günther: Influence of molar mass and of nucleating agents on the orientation of polyethylene terephthalate 73

Lenz, J.: The deformation behaviour of annealed polypropylene film tapes 75

Lataillade, J.-L. and J. Pouyet: Rheological properties of high polymers at high rates of strain 77

Dröscher, M. and U. Bandara: Extrusion of thermoplastic elastomers in the solid state 81

Hetenyi, J.: Some applications of thermo-mechanical rheology for testing of plastics 84

Brüller, O. S.: Energy considerations of the time-dependent failure of polymers 87

van Dam, J. C. and F. H. Mischgofsky: Rheology and stircasting of (organic) alloys 91

Marin, G., J. P. Montfort, and Ph. Monge: Viscoelastic properties of concentrated polymer solutions and melts: a reduced form of linear viscoelasticity	95
La Mantia, F. P., D. Acerno, and D. Curto: Extensional flow of HDPE/LDPE blends	98
Ng, T. S.: Dehnviskosität von Kautschukmischungen	102
Vlček, J.: The description of the profile balance and the elastic properties at die-swell	106
Laun, H. M.: Elastic properties of polyethylene melts at high shear rates with respect to extrusion	110
Závadský, E., J. Karniš, and V. Pechoč: The time, temperature and shear dependence of the viscosity of polypropylene and its influence upon the extrusion process	116
Dealy, J. M.: A shear stress transducer for molten polymers	121
Knappe, W.: Rheological measurements with technical polymers on the injection moulding machine	124
Agur, E. E. and J. Vlachopoulos: A computer model of plasticating extrusion	127
Gleißle, W.: Stresses in polymer melts at the beginning of flow instabilities (melt fracture) in cylindrical capillaries	130
Waters, N. D.: The effect of "shear thinning" on the interfacial stability of two stratified liquids	134
Hinkelmann, B.: Zur analytischen Beschreibung des Füllstoffeinflusses auf das Fließverhalten von Kunststoff-Schmelzen	137
Gast, T. und K. U. Kramm: Viskositätsmessung mit dem longitudinal schwingenden Band	140
Bauer, H. and G. Meerlender: Newtonian reference materials with $\nu < 1 \text{ mm}^2/\text{s}$ and their application in extending the range of capillary viscometers	145
Klein, J., H. G. Müller und G. Leidigkeit: Viskosimetrie bei hohem Schergefälle und hoher Temperatur – eine instrumentelle Entwicklung	148
Wolf, B. A., H. Geerissen, R. Jend, and J. R. Schmidt: Pressure influences on the viscosity of polymer solutions	151
Kirschke, K.: Phenomena of high polymer solutions while flowing through capillaries at high rates of shear	154
Hsü, Y. T. and P. Schümmer: Some general rheological properties of dilute polymer solutions predicted from intrinsic viscosity measurements	157
Schümmer, P. and K. H. Tebel: Design and operation of the free jet elongational rheometer	160
Schümmer, P. and W. Zang: Measurement of dynamic properties of dilute polymer solutions with a Laser-Doppler velocimeter	163
Sobolík, V., O. Wein, and P. Mitschka: Periodic flows of pseudoplastic fluids in pipes	167
Zahorski, S.: Effect of small-amplitude vibrations on viscoelastic flows in a plane slider bearing	170
Oliver, D. R. and S. I. Bakhtiyarov: Enhanced load bearing by polymer solutions lubricating external near-contact of sliding cylinders	173
Andrä, R. and J. H. Spurk: Complex viscosity of viscoelastic damping fluids	176
Hassager, O. and C. Bisgaard: A finite element code for initial value problems with a Maxwell model ...	180
Bisgaard, C. and O. Hassager: An experimental investigation of velocity fields around spheres and bubbles moving in non-Newtonian liquids	183
Röpke, K.-J. and P. Schümmer: Natural convection of a viscoelastic fluid	186
Perera, M. G. N., A. Lyazid, and O. Scrivenner: Numerical simulation of elongational flow behaviour in the cross cell experiments	189
Walters, K. and D. M. Rawlinson: On some contraction flows for Boger fluids	193
Dembek, G.: Structural changes of polyisobutylene solutions induced by orifice flow	199
Fruman, D. H. and M. Barigah: Rheological interpretation of pressure anomalies of aqueous dilute polymer solutions (ADPS) in orifice flow	202
Rehage, H. and H. Hoffmann: Shear induced phase transitions in highly dilute aqueous detergent solutions	207

Stanislav, J. F.: Use of polymers in oil recovery processes	210
Haas, R. and F. Durst: Viscoelastic flow of dilute polymer solutions in regularly packed beds	212
Durst, F., R. Haas, and W. Interthal: Laminar and turbulent flows of dilute polymer solutions: a physical model	218
Gampert, B. und P. Wagner: Experimentelle Untersuchung turbulenter Rohrströmungen hochreiner wäßriger Polyacrylamid-Lösungen	224
Hibberd, M., M. Kwade, and R. Scharf: Influence of drag reducing additives on the structure of turbulence in a mixing layer	228
Bewersdorff, H. W.: Effect of a centrally injected polymer thread on drag in pipe flow	233
van Diemen, A. J. G. and H. N. Stein: The rheological behaviour of $\text{Ca}(\text{OH})_2$ suspensions in water	236
Ulbrecht, J. J., P. Stroeve, and P. Prabodh: Behaviour of double emulsions in shear flows	239
Masi, P., L. Nicodemo, L. Nicolais, and G. Tagliatela: Behavior of viscoelastic glass bead suspensions under superposed flows	244
Silberberg, A.: Biorheological matching: muco-ciliary interaction and epithelial clearance	251
Pascale, K., H. W. Weizsäcker, A. Gauster, and G. Dohr: The rheological properties of the arterial wall	253
Anadere, I., H. Chmiel, and P. Heimbürg: Viscoelastic parameters of blood in patients with myocardial infarction compared to normal donors	257
Altmann, S. and H. Zeidler: Preliminary experiments for the preparation of hyaluronic acid from synovial fluid without rheological changes	260
Lefebvre, J.: Viscosity of concentrated protein solutions	266
Papers Submitted but not Presented	
Dahan, M. and M. Predeleanu: Viscoelastic properties of laminated bodies	272
Malkin, A. Ya. and V. P. Beghishev: Induction period in curing of oligomers at high shear rates	275
Černoch, J. und J. Tluchoř: Eine neue Methode zur Auswertung von Plasti-Corder-Plastogrammen	278
Kozłowski, M.: Rheological properties of vinyl chloride polymer melts	281
Piğłowski, J.: Rheologisches Verhalten von mehrphasigen Schmelzen aus Polyvinylchlorid und Polyurethan	283
Drouot, R.: Diffusion of macromolecules in non-uniform velocity gradients	285
Reher, E.-O., R. Krämer und R. Lipp: Zur Modellierung und experimentellen Untersuchung von Dehnströmungsprozessen am Beispiel von hochpolymeren Lösungen	287
Zecha, H., K. Wulf und H. Schlacken: Zum rheologischen Verhalten konzentrierter Dispersionen organischer Polymere	290
Sobotka, Z.: Positive and negative flow and viscosity of clay suspensions	293
Řiha, P.: The unified description of viscoelastic and thixotropic properties of human blood	296
Schwenke, K. D. and H. Schmandke: Influence of a chemical modification on the formation of protein gels	299
List of Contributed Papers of which no Short Versions are Included	302
Subject Index	303