CONTENTS

Preface

1. INTRODUCTORY LECTURE

Short-range and long-range forces between hydrophilic surfaces and biopolymers in aqueous solutions .............................................................. 3
   J.N. Israelachvili

2. STRUCTURE OF GELS AND GELATION

Thermoreversible gelation with multiple junctions in associating polymers ............ 25
   F. Tanaka

Effect of electric charges on the volume phase transition of thermosensitive gels ........... 35
   H. Maeda, H. Kawasaki and S. Sasaki

Structure and dynamics of ovalbumin gels .................................................. 45
   N. Nemoto

Thermoreversible gelation strongly coupled to polymer conformational transition ......... 53
   F. Tanaka and T. Koga

Hydrogels from N-isopropylacrylamide oligomer ........................................ 59
   H. Hachisako, S. Miyagawa and R. Murakami

Kinetic effects of the gel size on the thermal behavior of poly- (N-isopropylacrylamide) gels: a calorimetric study ......................................... 65
   H. Kawasaki, S. Sasaki and H. Maeda

Characterizations of dehydrated polyacrylamide gel and its formation process .......... 71
   K. Hara, A. Nakamura, N. Hiramatsu and A. Matsumoto

Viscoelastic behavior of tungstic acid gel during the gelation process ................. 79
   H. Okabe, K. Kuboyama, K. Hara and S. Kai
The volume phase transition of DNA and RNA gels
E. Takushi

Rheological properties and microstructure of monodispersed O/W emulsion agar gel
S. Gohtani, K-H. Kim and Y. Yamano

3. POLYSACCHARIDES

Viewing biopolymer networks, their formation and breakdown by AFM

Thermally induced gels obtained with some amphiphilic polysaccharide
derivatives: synthesis, mechanism and properties
M. Rinaudo and J. Desbrières

Industrial production of new emulsifying polysaccharide by plant cell culture
A. Lane

Production and applications of novel plant cell culture polysaccharides
N. Mahmoudifar, E. Chai, D. Dunstan and A. Lane

Structural features of polysaccharide of Hericium erinaceum
T. Inakuma, K. Aizawa, R. Yamauchi and K. Kato

Structural and physical features of polysaccharide of Tremella aurantia
K. Aizawa, T. Inakuma and T. Kiho

Dynamic light scattering of dilute and semi-dilute xanthan solutions and
comparison with rheological characteristics
A. B. Rodd, D. E. Dunstan and D. V. Boger

Relationships between structural features, molecular weight and
rheological properties of cereal β-D-glucans
W. Cui and P. J. Wood

New biopolymers produced by nitrogen fixing microorganisms for use in foods
A. Scamparini, C. Vendruscolo, I. Maldonade, J. Druzian and D. Mariuzzo

Studies on production and rheology of a polysaccharide synthesized
by Beijerinckia sp strain 7070
F. F. Padilha, J. L. Vendruscolo, O. A. Dellagostin, A. R. P. Scamparini and
C. T. Vendruscolo
Heteropolysaccharides produced by *Xanthomonas campestris pv pruni* C24

C.T. Vendruscolo, A. da S. Moreira, A. da S. Souza, R. Zambiazi and
A.R.P. Scamparini,

Rheological properties of guar galactomannan solutions filled
with particulate inclusions

P. Rayment, P.R. Ellis and S.B. Ross-Murphy

Characterization of chitosan film and structure in solution


Elsinan, a potential food hydrocolloid produced by *elsinoe* species: properties and
enzymatic degradation

A. Misaki, Y. Tsumuraya and M. Kakuta

Effects of alkali metal salts on the viscoelasticity of funoran and \( \lambda \)-carrageenan

M. Watase, T. Aihara and K. Nishinari

Texture and structure of high-pressure-frozen konjac

A. Teramoto and M. Fuchigami

Extraction of highly gelling pectins from sugar beet pulp

T. Turquois, M. Rinaudo, F.R. Taravel and A. Heyraud

The structure of soluble soybean polysaccharide

A. Nakamura, H. Furuta, H. Maeda, Y. Nagamatsu and A. Yoshimoto

Comparison of vegetable xyloglucans by NMR and immunochemical analyses

Y. Sone, A. Wakai and T. Maekawa

4. CELLULOSE

Regiocontrolled cellulose functionalization: possibilities and problems

D. Klemm and W. Wagenknecht

Interaction between cellulosic polysaccharides and water

H. Hatakeyama and T. Hatakeyama

Gelation of cellulose/calcium thiocyanate solution and
its application to spinning for fiber

M. Hattori, Y. Shimaya and M. Saito
SANS studies of aqueous suspension of microcrystalline cellulose .......................... 277
M. Sugiyama, K. Hara, N. Hiramatsu, A. Nakamura and H. Iijima

Influence of surface charge on viscosity anomaly of microcrystalline cellulose
suspensions ................................................................. 283
J. Araki, M. Wada, S. Kuga and T. Okano

5. STARCH

Rheological behavior of heated starch dispersions: role of starch granule ..................... 291

The genetic effects on some physico-chemical properties of starch granules .............. 301
N. Inouchi, D.V. Glover and H. Fuwa

A simultaneous measurement of frequency dependencies of viscoelastic properties
during heating for starch disperse systems using Fourier transform technique .......... 307
K. Katsuta, K. Tanaka, E. Maruyama, M. Kubo and T. Ueda

Rheological study on physical modification starches ................................................. 313
S. Akuzawa, S. Sawayama and A. Kawabata

Rheological and DSC studies of chemically modified starch .................................... 319
K. Morikawa and K. Nishinari

Effect of defatting of rice on the gelatinization ....................................................... 325
S. Miwa, H. Oda, T. Takaya and K. Nishinari

Effects of maltose and fructose on the gelatinization and
retrogradation of wheat starch ...................................................... 331
K. Y. Kim

The effect of water interactions on the rheological behaviour of amylose,
amylopectin, and mixtures from corn .................................................................. 337
S. J. McGrane, C. J. Rix, D. E. Mainwaring and H. J. Cornell

Rheological studies on the effects of the temperature of heat-moisture treatment
on the retrogradation of corn starch ..................................................................... 343
T. Takaya, C. Sano and K. Nishinari
Starch as a filler, matrix enhancer and a carbon source in freeze-dried denitrifying alginate beads .......................... 347
Y. Tal, J.van Rijn and A. Nussinovitch

6. PROTEINS

A comparison of the gelling and foaming properties of whey and egg proteins .................. 357
E.A. Foegeding, L.H. Li, C.W. Pernell and S. Mleko

Structure and rheology of gels formed by aggregated protein particles ...................... 367
T. van Vliet

Heat set proteins - models for the concentration and temperature dependence of the gelation time ....................................... 379
S.B. Ross-Murphy and A. Tobitani

Dynamic light scattering study of supramolecular structure of annelid extracellular multi-subunit hemoglobin .................. 389
K. Kubota, M. Yamaki, S. Ebina and T. Gotoh

Gelation properties and interactions of fish proteins ............................................. 399
N.K. Howell

Enhanced gel formation of whey proteins and egg white proteins by α-lactalbumin ......... 407
S. Hayakawa and M-L. Anang

Viscoelastic behavior of dehydrated egg white gel ........................................... 413
A. Nakamura, K. Hara, A. Matsumoto and N. Hiramatsu

Evaluation of the fractal dimension for aggregates in heat induced BSA gels .................. 417
H. Kumagai, T. Hagiwara, O. Miyawaki and K. Nakamura

Analysis of heat-induced BSA aggregates by scattering methods ................................. 423
T. Hagiwara, H. Kumagai, T. Suzuki and R. Takai

Rheological studies on preheated β-conglycinin and glycinin .................................. 429
T. Nagano, T. Akasaka and Y. Fukuda

Effects of NaCl and temperature of the gelation of soybean glycinin ........................ 435
T. Wongprecha, T. Takaya, T. Kawase, T. Nagano and K. Nishinari
Rheological study on pH-induced gelation of reconstituted skim milk at different temperatures and concentrations .......................... 441
A. Tobitani, N. Ueda, Y. Shiinoki, K. Joho and T. Yamamoto

Viscoelastic properties of acid-induced milk gel at different gelation temperatures ................. 447
R. Niki, H. Motoshima and F. Tsukasaki

Characterization of globin hydrolyzates by light scattering .................................................. 453
X.Q.Liu, M. Nakajima and Y. Sano

Poly (γ-glutamic acid) from Bacillus subtilis as an optically heterogeneous peptide in which D- and L-glutamic acid isomers are copolymerized into a single chain .................. 459
T. Tanaka and M. Taniguchi