

PROGRESS IN COLLOID & POLYMER SCIENCE

Editors: F. Kremer (Leipzig) and G. Lagaly (Kiel)

Volume 102 (1996)

Gels

Guest Editor:

M. Zrínyi (Budapest)



STEINKOPFF
DARMSTADT



Springer

ISBN 3-7985-1065-2
ISSN 0340-255 X

Die Deutsche Bibliothek –
CIP-Einheitsaufnahme

Gels : [proceedings of the Europhysics
Conference on Gels, held in
Balatonszeplak, Hungary, in September
1995] / guest ed. : M. Zrínyi. – Darmstadt :
Steinkopff ; New York : Springer, 1996
(Progress in colloid & polymer science ;
Vol. 102)
ISBN 3-7985-1065-2

NE: Zrínyi, Miklós [Hrsg.]; Europhysics
Conference on Gels (1995, Balaton-
széplak); GT

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically those rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in other ways, and storage in data banks. Duplication of this publication or parts thereof is only permitted under the provisions of the German Copyright Law of September 9, 1965, in its version of June 24, 1985, and a copyright fee must always be paid. Violations fall under the prosecution act of the German Copyright Law.

The use of registered names, trademarks, etc. in this publication does not imply, even in the absence of specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

© 1996 by Dr. Dietrich Steinkopff Verlag GmbH & Co. KG, Darmstadt.

Chemistry editor: Dr. Maria Magdalene Nabbe; English editor: James C. Willis; Production: Holger Frey, Bärbel Flauaus.

Type-Setting: Macmillan Ltd.,
Bangalore, India

Printing: Druckhaus Beltz, Hemsbach

Research and development of gels has experienced a rapid escalation, attracting worldwide interest and motivating the Macromolecular Board of the European Physical Society to organize a conference on gels.

The Europhysics Conference on Gels was held September 1995, in Balatonszeplak, Hungary. It was organized by the Macromolecular Board of the European Physical Society in cooperation with the Polymer Networks Group. The local organizers were the Hungarian Chemical Society and the Technical University of Budapest.

The purpose of this conference was to review the state of art and to present and discuss recent progress of gels and their applications and to look toward the future of gels. Since research into gels is a field which requires the development of multidisciplinary research collaborations, the major aim of the conference was therefore to bring together scientists from different disciplines and backgrounds in order to provide an excellent opportunity to exchange the latest scientific results and encourage further development. More than 160 participants from 26 countries attended the conference. The topics of contributions covered fundamentals and applications of gels formed from inorganic and organic polymers, colloidal particles and surfactant systems, new powerful methods such as scattering techniques, rheology, atomic force microscopy, swelling pressure and mechanical measurements, gels with sensitivity to changes in chemical and physical environment, novel technical and biomedical applications, computer simulation and new theoretical approaches.

The program was well-balanced between theoretical and practical aspects of gels and gelation. We gratefully acknowledge the financial support of the following institutions:

Commission of the European Communities Directorate General for Science, Research & Development, the Hungarian Academy of Sciences, the Hungarian Chemical Society, the Hungarian National Committee for Technological Development, Technical University of Budapest, IFHERD and FEFA Foundations.

Their support has made it possible to invite scientists from countries with limited economic resources, making the meeting a truly international event.

This Progress Volume contains a selection of the papers presented at the Europhysics Conference on Gels. It is hoped that it demonstrates the manifold nature and diversity of gels as an interdisciplinary science.

Miklós Zrínyi

	Preface	V
H. Galina, J. Lechowicz:	Monte-Carlo modeling of polymer network formation	1
V. I. Irzhak, S. E. Varyukhin, T. F. Irzhak:	Relaxation properties of polymer gels and concept of physical networks . .	4
F. A. de Wolf, R. C. A. Keller:	Characterization of helical structures in gelatin networks and model poly- peptides by circular dichroism	9
V. Sovilj, P. Dokič:	Influence of shear rate on gelation of biopolymers solution	15
G. Palazzo, M. Giustini, A. Mallardi, G. Colafemmina, M. D. Monica, A. Ceglie:	Photochemical activity of the bacterial reaction center in polymer-like phospholipids reverse micelles	19
L. Picton, G. Muller:	Rheological properties of modified cellulosic polymers in semi-dilute regime: Effect of salinity and temperature	26
M. Grisel, G. Muller:	Rheological properties of Schizophyllan in presence of borate ions . . .	32
R.-H. Mikelsaar:	Molecular modelling of cellulose and hyaluronan three-dimensional structure	38
T. F. Irzhak, N. I. Peregudov, M. L. Tai, V. I. Irzhak:	Concept of bond blocks in kinetics of formation and destruction of polymer gels	42
N. N. Volkova, V. P. Tarasov, L. P. Smirnov, L. N. Erofeev:	Sol-gel transition and molecular dynamics in the systems based on the copolymer of methyl methacrylate with methacrylic acid	47
B. Ginzberg, S. A. Bilmes:	Titania sols and gel synthesized from reverse micelles	51
L. Barsi, A. Büki, D. Szabó, M. Zrínyi:	Gels with magnetic properties	57
P. Terech:	Networks of surfactant-made physical organogels	64
P. Dokič, I. Šefer, V. Sovilj:	Shear induced polymer interactions and gelation in ureaformaldehyde polycondensates	71
L. Halász, O. Vorster:	Gelation in reactive polyester powder coating systems	76
T. Roels, F. Deberdt, H. Berghmans:	Thermoreversible gelation in syndiotactic polystyrene/solvent systems . .	82
M. Ye. Solojev, V. A. Kapranov, V. I. Irzhak, A. G. Galushko:	The mechanical properties of elastomers with chemical and physical junc- tions	86
Ö. Pekcan, Y. Yilmaz:	Fluorescence method to study gelation swelling and drying processes in gels formed by solution free radical copolymerization	89
A. S. Vasilescu, C. C. Ponta:	A ¹³ C-NMR study of polyacrylic acid gels as radioactive ion sorbents . .	98
L. Hegedüs, M. Wittmann, N. Kirschner, Z. Noszticzius:	Reaction, diffusion, electric conduction and determination of fixed ions in a hydrogel	101
A. Büki, É. Kárpáti-Smidróczki, K. Meiszel, M. Zrínyi:	Experimental and theoretical investigation of static and dynamic chemical pattern formations in gels	110
Yu. Samchenko, U. Ulberg, N. Pertsov:	Hydrogel medicinal systems of prolonged action	118
M. Dragusin, D. Martin, M. Radoiu, R. Moraru, C. Oproiu, S. Marghitu, T. Dumitrica:	Hydrogels used for medicine and agriculture	123

Z. Hórvölgyi, J. H. Fendler, M. Máté, M. Zrínyi:	An experimental approach to the determination of two-dimensional gel- point: a film balance study	126
C. C. Ponta, Q. K. Tran:	Consolidation of porous structures by polyacrylic acid gels	131
V. I. Irzhak, L. I. Kuzub:	Kinetics of sorption processes in polymer gels	138
D. Martin, M. Dragusin, M. Radoiu, R. Moraru, A. Radu, C. Oproiu, G. Cojocaru:	Polymers for waste water treatment	147
	Author Index	152
	Subject Index	152