

# **Physical Chemistry in Action**

Physical Chemistry in Action presents topical volumes which outline essential physicochemical principles and techniques needed for areas of interdisciplinary research. The scope and coverage includes all areas of research permeated by physical chemistry: organic and inorganic chemistry; biophysics, biochemistry and the life sciences; the pharmaceutical sciences; crystallography; materials sciences; and many more. This series is aimed at students, researchers and academics who require a fundamental knowledge of physical chemistry for working in their particular research field. Each volume begins with an introductory chapter aimed at the novice, which provides background and a valuable perspective on the respective field. The following chapters discuss the physicochemical concepts and methods used, as well as applications of the stated methods in the field. Volumes are edited and include contributed chapters from researchers working in the field. Contributions by authors from all of the various disciplines are encouraged.

More information about this series at <http://www.springer.com/series/10915>

Miquel Àngel Cuevas-Diarte · Harry A. J. Oonk  
Editors

# Molecular Mixed Crystals

 Springer

*Editors*

Miquel Àngel Cuevas-Diarte  
Grup de Cristal·lografia Aplicada  
Universitat de Barcelona  
Barcelona, Spain

Harry A. J. Oonk  
Department of Earth Sciences  
Utrecht University  
Utrecht, The Netherlands

ISSN 2197-4349

ISSN 2197-4357 (electronic)

Physical Chemistry in Action

ISBN 978-3-030-68726-7

ISBN 978-3-030-68727-4 (eBook)

<https://doi.org/10.1007/978-3-030-68727-4>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2021

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

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

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG  
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

# Contents

## Part I Introductory Part

<b>1 Introduction</b> .....	3
M. À. Cuevas-Diarte and H. A. J. Oonk	
<b>2 Molecular Homeomorphism and Crystalline Isomorphism</b> .....	9
Y. Haget, N. B. Chanh, H. A. J. Oonk, and M. À. Cuevas-Diarte	
<b>3 Thermodynamics</b> .....	27
H. A. J. Oonk, T. Calvet, and M. H. G. Jacobs	
<b>4 Polymorphism</b> .....	41
I. B. Rietveld, R. Céolin, and J. Ll. Tamarit	

## Part II Facts and Features

<b>5 Aromatics</b> .....	79
P. R. van der Linde and H. A. J. Oonk	
<b>6 Chains</b> .....	107
D. Mondieig, E. Moreno-Calvo, and M. À. Cuevas-Diarte	
<b>7 Plastic Crystals</b> .....	163
J. Ll. Tamarit, M. Barrio, L. C. Pardo, and Ph. Negrier	
<b>8 Liquid Crystals</b> .....	191
J. Salud and D. O. López	
<b>9 Enantiomers</b> .....	221
H. A. J. Oonk and I. B. Rietveld	
<b>10 Complexes</b> .....	251
A. Marbeuf and D. Mikailitchenko	
<b>11 Triacylglycerols</b> .....	269
L. Bayés-García, M. À. Cuevas-Diarte, and T. Calvet	

**Part III Applications**

<b>12 Phase Change Materials</b> .....	291
M. A. Cuevas-Diarte and D. Mondieig	
<b>13 Crystallization</b> .....	305
H. P. C. Schaftenaar, M. Matović, and J. H. Los	
<b>Subject Index</b> .....	327
<b>Substances Index</b> .....	333

# Contributors

**M. Barrio** Grup de Caracterització de Materials, Universitat Politècnica de Catalunya, Barcelona, Spain

**L. Bayés-García** Grup de Cristal·lografia Aplicada, Universitat de Barcelona, Barcelona, Spain

**T. Calvet** Grup de Cristal·lografia Aplicada, Universitat de Barcelona, Barcelona, Spain

**N. B. Chanh** Université de Bordeaux, LOMA, Talence, France

**M. À. Cuevas-Diarte** Grup de Cristal·lografia Aplicada, Universitat de Barcelona, Barcelona, Spain

**R. Céolin** Grup de Caracterització de Materials, Universitat Politècnica de Catalunya, Barcelona, Spain

**Y. Haget** Université de Bordeaux, LOMA, Talence, France

**M. H. G. Jacobs** Technische Universität-Clausthal, Clausthal, Germany

**J. H. Los** Ecole Normale Supérieure, Paris-Saclay, France

**D. O. López** Grup de Recerca de les Propietats Físiques dels Materials (GRPFM), Universitat Politècnica de Catalunya, Barcelona, Spain

**A. Marbeuf** CNRS-Université de Bordeaux, Talence, France

**M. Matović** Openbaar Lyceum Zeist, Zeist, The Netherlands

**D. Mikailitchenko** CNRS-Université de Bordeaux, Talence, France

**D. Mondieig** LOMA, UMR 5798, Université de Bordeaux, Talence, France

**E. Moreno-Calvo** Grup de Cristal·lografia Aplicada, Universitat de Barcelona, Barcelona, Spain

**Ph. Negrier** LOMA, UMR 5798, Université de Bordeaux, Talence, France

**H. A. J. Oonk** Universiteit Utrecht, Utrecht, The Netherlands

**L. C. Pardo** Grup de Caracterització de Materials, Universitat Politècnica de Catalunya, Barcelona, Spain

**I. B. Rietveld** Laboratoire Sciences et Méthodes Séparatives, Université de Rouen Normandie, Mont Saint Aignan, France

**J. Salud** Grup de Recerca de les Propietats Físiques dels Materials (GRPFM), Universitat Politècnica de Catalunya, Barcelona, Spain

**H. P. C. Schaftenaar** Universiteit Utrecht, Utrecht, The Netherlands

**J. Ll. Tamarit** Grup de Caracterització de Materials, Universitat Politècnica de Catalunya, Barcelona, Spain

**P. R. van der Linde** Universiteit Utrecht, Utrecht, The Netherlands