

TABLE OF CONTENTS

Preface	xiii
Roald Hoffmann Nobel laureate in Chemistry	

Preface	xvii
Rom Harré President of the International Society for the Philosophy of Chemistry	

Introduction	1
Jean-Pierre Llored	

Part I. Exploring Chemical Practices

The New Challenges of Current Chemical Practices.....	14
Minh-Thu Dinh Audouin	

Life Cycle Assessment and Ecodesign: Innovation Tools for a Sustainable and Industrial Chemistry	34
Sylvain Caillol	

The Precautionary Principle and Chemical Risks.....	65
Olivier Godard	

The Limits of Modern Chemical Analysis: Metrological and Epistemological Insights.....	97
Stéphane Bouchonnet and Saïd Kinani	

Interdisciplinary Issues in Nanoscale Research.....	121
Joachim Schummer	

Chemistry of the Stratosphere: Metrological Insights and Reflection about Interdisciplinary Practical Networks.....	138
Gwenaël Berthet and Jean-Baptiste Renard	

Current Relations between Chemistry and Biology: The Example of Microarrays	155
Daniel Daugeron, Alessandra Gucki Riva and Alain Hénaut	

Chemistry and Interfaces	172
Anne Aimable, Roberta Brayner, Jean-Pierre Llored, Mathieu Rozé and Stéphane Sarrade	

Conclusion: Chemistry as Practice	202
Rom Harré	

Part II. Methodologies: How to Study Chemistry?

Historical Approaches

Philosophy of Chemistry: Where has it been and Where is it Going.....	208
Eric Scerri	

The Chemical Bond: Some Historical Insights.....	226
Kostas Gavroglu and Ana Simões	

The Relevance of Boyle's Chemical Philosophy for Contemporary Philosophy of Chemistry	240
Marina Paola Banchetti-Robino	

Diderot, Philosopher of Chemistry, from the Enlightenment to Contemporary Science.....	266
François Pépin	

Social Dynamics of Science in the Making	286
Baptiste Voillequin	

Agricultural Chemistry, Agriculture and What will Happen to the World: Considering Swift, Comte, Berthelot and Some Others	300
Dominique Pécaud	

Techno-scientific Approaches

Some Remarks on the Origin, Scope and Evolution of the Notion of "Technoscience"	320
Gilbert Hottois	

Chemistry as a Technoscience? 330
Bernadette Bensaude-Vincent

Materiality and Abstraction in Modern Chemistry 342
Ursula Klein

Practical Approaches

What is a Scientific Concept? Some Considerations Concerning
Chemistry in Practical Realist Philosophy of Science 364
Rein Vihalemm

From Chemical Practices to a Relational Philosophy of Chemistry 385
Jean-Pierre Llored and Michel Bitbol

Chemical Analysis as Dematerialization 416
Pierre Laszlo

A Pragmatic Approach to the Atomic Model in Chemistry 426
Manuel Bächtold

The Tao of Chemistry 452
Andrew Pickering

Complementary Chemistry 465
Hasok Chang

Transcendental Approaches

A Kantian Perspective for the Philosophy of Chemistry 478
Mariana Córdoba and Olimpia Lombardi

Pragmatically Naturalized Transcendental Philosophy of Science
and Philosophy of Chemistry 491
Sami Pihlström

Analytical Approaches

Three Metaphysical Issues in Chemistry 510
Robin Findlay Hendry

Mereological Structure in Chemical Substances and their Transformations: An Analytic Perspective on the Historical Development of these Concepts.....	527
Paul Needham	
Relations between Levels from a Chemical Perspective	558
Anna Ciaunica-Garrouty	
Conclusion: What has Philosophy to do with Chemistry?.....	575
Joseph E. Earley, Sr.	
Part III. Concepts	
Affordance and Hinges: New Tools in the Philosophy of Chemistry.....	580
Rom Harré	
Three Concepts of Chemical Closure and their Epistemological Significance	596
Joseph E. Earley, Sr.	
An Invitation to Chemical Process Philosophy	617
Joseph E. Earley, Sr.	
About the Chemical Experiment	628
José A. Chamizo	
Sustainable Chemistry	640
Laura Maxim and Isabelle Rico-Lattes	
Concepts of Emergence in Chemistry	659
Alexandru Manafu	
Downward Causation without Foundations.....	675
Michel Bitbol	
The Significance of Structure: Quantum Chemistry and Organic Synthesis.....	706
William Goodwin	
Metachemistry	725
Alfred Nordmann	

Global Conclusion: Investigating the Interplay between Chemistry, Chemical Practice, and Philosophy	744
By Jean-Pierre Llored	
Contributors.....	756