Essential Textbooks in Chemistry

ASTROCHEMISTRY

From the Big Bang to the Present Day

By **Claire Vallance** (*University of Oxford, UK*)



Key Features:

- Shows how the evolution of the universe and planet Earth can be understood in terms of basic chemical and physical principles
- Provides an introduction and overview of atmospheric chemistry and physics
- Covers experimental and theoretical methods of astrochemistry

Description:

The rapidly growing field of astrochemistry focuses on the chemistry occurring in stars, planets, and the interstellar medium, bringing together elements of chemistry, physics, astrophysics, and biology. *Astrochemistry: From the Big Bang to the Present Day* describes the chemical history of the Universe, our solar system, and our planet. It explores in some detail the 'alien' chemistry occurring in interstellar gas clouds, the regions where stars and planets are formed, and also looks at the theoretical and experimental methods that allow us to carry out Earth-based studies of astrochemistry.

The evolution of the Universe and the complex chemistry occurring both in interstellar space and in the planetary systems that form in these regions is explained primarily in terms of basic principles of physical chemistry. While there is plenty to interest the general reader, this book is aimed at intermediate to advanced undergraduates of chemistry and astrochemistry, highlighting many different aspects of physical chemistry and demonstrating their relevance to the world we live in.

This book was written in conjunction with Atmospheric Chemistry: From the Surface to the Stratosphere *(2017) @World Scientific Publishing.*

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Type: Textbook

Main Subject: Chemistry

Sub-subjects: Physical Chemistry; Environmental/Atmospheric Chemistry; Astronomy, Astrophysics and Cosmology (Including Geophysics); Climatology/Meteorology

BIC: PNR

BISAC: SCI013050; SCI005000; SCI078000

Keywords: Astrochemistry; Interstellar Chemistry; Atmospheric Chemistry; Astronomy; Physical Chemistry; Spectroscopy; Kinetics; Thermodynamics

Imprint: World Scientific Europe

Readership: Intermediate to advanced undergraduates of chemistry and astrochemistry, and general readers interested in the topics

Contents:

- Measuring the Universe
- From the Big Bang to the First Atoms
- Stars and the Creation of the Higher Elements
- Interstellar Chemistry — Molecules in Space
- Laboratory-Based Astrochemistry: Theory
- Laboratory-Based Astrochemistry: Experiment
- Formation of the Solar System and the Evolution of Earth
- ***Appendices:***
  - Rates of Chemical Reactions 149
  - The Variation Principle and the Linear Variation Method
  - Mass-Weighted Coordinates and the Skew Angle

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