

Atkins' Physical Chemistry

Eighth Edition

PETER ATKINS, *University of Oxford* and JULIO DE PAULA, *Lewis and Clark College, USA*

“Atkins” is the gold standard of technical education in Physical Chemistry.
 Stephen Fletcher, Loughborough University

- Enhanced explanation and presentation of mathematical content place emphasis on full understanding of important mathematical principles, without sacrificing depth or rigour of treatment.
- 'Exploration' questions offer interactive learning via 'living graphs' in the Online Resource Centre, encouraging students to actively explore and test their understanding of the subject.
- 'Impacts on' sections show how physical chemistry underpins biology, biochemistry, medicine, nanoscience, and astrophysics, demonstrating to the student its fundamental importance at the forefront of current interdisciplinary research fields.

WORKED EXAMPLES

ILLUSTRATION BOXES PROVIDE MATHS SUPPORT

Fig. 3.13 The logarithmic increase in entropy of a substance as it is heated at constant volume. Different curves correspond to different values of the constant-volume heat capacity (which is assumed constant over the temperature range) expressed as $C_{V,m}/R$.

Self-test 3.4 Calculate the entropy change when the same initial sample is compressed to 0.500 dm^3 and cooled to -25°C . [-0.44 J K^{-1}]

Illustration 3.4 Calculating a standard molar entropy

	$S_m^\ominus / (\text{J K}^{-1} \text{ mol}^{-1})$
Debye extrapolation	1.92
Integration, from 10 K to 35.61 K	25.25
Phase transition at 35.61 K	6.43
Integration, from 35.61 K to 63.14 K	23.38
Fusion at 63.14 K	11.42
Integration, from 63.14 K to 77.32 K	11.41
Vaporization at 77.32 K	72.13
Integration, from 77.32 K to 298.15 K	99.20
Correction for gas imperfection	0.92
Total	192.06

Therefore, $S_m^\ominus(298.15 \text{ K}) - S_m^\ominus(0) = 192.1 \text{ J K}^{-1} \text{ mol}^{-1}$

Self-test 3.3 Calculating the entropy at low temperatures
 The molar constant-pressure heat capacity of a certain solid at 4.2 K is $0.45 \text{ J K}^{-1} \text{ mol}^{-1}$. What is its molar entropy at that temperature?

NOTES ON GOOD PRACTICE

SELF-TEST QUESTIONS

LINKS TO LIVING GRAPHS AVAILABLE VIA THE ONLINE RESOURCE CENTRE

Atkins' Physical Chemistry covers all that is essential for a chemistry degree, from the basic principles to modern applications. Up-to-date in both content and approach, the eighth edition sees a greater emphasis on the molecular view of physical chemistry and a move away from classical thermodynamics.

The mathematics intrinsic to physical chemistry often poses the greatest barrier to students' understanding. Atkins' Physical Chemistry offers careful explanations and extensive support to ensure that students can master the important mathematical principles. The text features an extensive pedagogical framework, including Worked Examples, Self-tests, Derivations, Illustrations, Justifications, Notes on good practice, and Commentaries, which guides students through the book to facilitate a true understanding of the subject.

ONLINE RESOURCE CENTRE

For lecturers:

- Figures from the book available to download to facilitate lecture preparation
- Figures in PowerPoint format
- Problems and exercises from the book plus additional end-of-chapter problems in a customisable format
- Powerpoint slides for each chapter containing checklists of key ideas

For students:

- Tables for group theory
- Web link library



ATKINS' PHYSICAL CHEMISTRY E-BOOK

The Online Resource Centre also provides access to the Atkins' Physical Chemistry, e-Book. The e-book is a complete online version of the textbook that takes advantage of its electronic medium to include many additional features. It provides a rich learning experience including Living Graphs and Explorations in Physical Chemistry. The e-book also offers lecturers flexibility and customisation options not previously possible with a printed book. Access to the e-book is included with purchase of the printed textbook, using the activation code card enclosed with the book.

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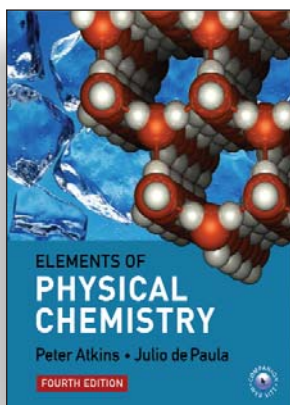
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PETER ATKINS, *University of Oxford* and JULIO DE PAULA, *Lewis and Clark College, USA*

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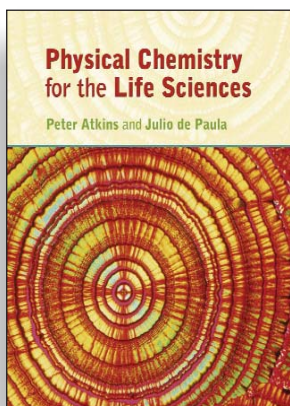
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PETER ATKINS, *University of Oxford* and JULIO DE PAULA, *Lewis and Clark College, USA*



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Chemistry World



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