

METADATA

Title: Analytical Chemistry 2.1

Other Titles: Greek translation

Language: Greek

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ISBN: 978-618-228-268-7

Subject: NATURAL SCIENCES AND AGRICULTURAL SCIENCES

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Keywords: Qualitative analysis / Quantitative analysis / QA/QC / Selectivity / Validation

Bibliographic Reference: Harvey, D., Lydakis-Simantiris, N. (Tr.), Economou, A. (Tr.), Pergantis, S. (Tr.), & Stalikas, K. (Tr.). (2025). Analytical Chemistry 2.1 [Undergraduate textbook]. Kallipos, Open Academic Editions. http://dx.doi.org/10.57713/kallipos-1012

Abstract

This Analytical Chemistry textbook is organised into four parts. Chapters 1–3 serve as a general introduction, providing an overview of analytical chemistry, a review of the basic equipment and mathematical tools of analytical chemistry, including significant figures, units, and stoichiometry, and an introduction to the terminology of analytical chemistry. Chapters 4–7 cover several topics that are important in understanding how analytical methods work. Later chapters are mostly independent of these chapters, allowing an instructor to choose those topics that support his or her goals. Chapter 4 provides an introduction to the statistical analysis of data. Methods for calibrating equipment and standardizing methods are covered in Chapter 5, along with a discussion of linear regression. Chapter 6 provides an introduction to equilibrium chemistry, stressing both the rigorous solution to equilibrium problems and the use of semiquantitative approaches, such as ladder diagrams. The importance

of collecting the right sample, and methods for separating analytes and interferents are the subjects of Chapter 7. Chapters 8–13 cover the major areas of analysis, including gravimetry (Chapter 8), titrimetry (Chapter 9), spectroscopy electro-chemistry (Chapter (Chapter 10), 11). chromatography and electrophoresis (Chapter 12), and kinetic methods (Chapter 13). Related techniques, such as acid-base titrimetry and redox titrimetry, are intentionally gathered together in single chapters. Combining related techniques in this way encourages students to see the similarity between methods, rather than focusing on their differences. Finally, the textbook concludes with two chapters discussing the design and maintenance of analytical methods, two topics of importance to all experimental chemists. Chapter 14 considers the development of an analytical method, including its optimisation, verification, and validation. Quality control and quality assessment are discussed in Chapter 15.



The Project is funded by the National Development Programme 2021-2025 of the Ministry of Education and Religious Affairs and implemented by the Special Account for Research Funds of the National Technical University of Athens and the Hellenic Academic Libraries Link.

