Analytical chemists work to improve the ability of all chemists to make meaningful measurements. Chemists working in the other traditional areas of chemistry, as well as in interdisciplinary fields such as medicinal chemistry, clinical chemistry, and environmental chemistry, need better tools for analyzing materials. The need to work with smaller samples, with more complex materials, with processes occurring on shorter time scales, and with species present at lower concentrations challenges analytical chemists to improve existing analytical methods and to develop new ones.

Typical problems on which analytical chemists work include qualitative analyses (What is present?), quantitative analyses (How much is present?), characterization analyses (What are the sample’s chemical and physical properties?), and fundamental analyses (How does this method work and how can it be improved?).

### 1.4.1 Key Terms

- characterization analysis
- fundamental analysis
- qualitative analysis
- quantitative analysis

### Additional Resources

Gathered here are three types of resources: suggested experiments, mostly from the *Journal of Chemical Education* and *The Chemical Educator*, that provide practical examples of concepts in the textbook; additional readings from the analytical literature that extend and supplement topics covered in the textbook. Although primarily intended for the use of instructors, these resources also will benefit students who wish to pursue a topic at more depth.

The role of analytical chemistry within the broader discipline of chemistry has been discussed by many prominent analytical chemists. Several notable examples are listed here.


For additional discussion of clinical assays based on paper-based microfluidic devices, see the following papers.


This textbook provides one presentation introducing the discipline of analytical chemistry. There are other textbooks for introductory courses in analytical chemistry and you may find it useful to consult them when you encounter a difficult concept; often a fresh perspective will help crystallize your understanding. The textbooks listed here are excellent resources.


• Rubinson, J. F.; Rubinson, K. A. Contemporary Chemical Analysis, Prentice Hall: Upper Saddle River, NJ.


To explore the practice of modern analytical chemistry there is no better resource than the primary literature. The following journals publish broadly in the area of analytical chemistry.

• Analytical Chemistry
• Analytica Chimica Acta
• Analyst
• Analytical Bioanalytical Chemistry (ABC)

References

Contributors

- David Harvey (DePauw University)