

## BOOK REVIEW

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### Review of: *Handbook of Drug Analysis: Applications in Forensic and Clinical Laboratories*

**REFERENCE:** Liu, RH, Gadzala DE. Handbook of drug analysis: applications in Forensic and Clinical Laboratories. American Chemical Society Publications, Washington, DC, 1997, 367 pp.

The authors wrote this book with the intention of bridging the gap between instrumental and analytical texts. The goal was to provide both a broad understanding of forensic and clinical principles for new analysts and a guide/reference for experienced practitioners. The text is organized into four sections: 1) nature of drug abuse, sample characteristics and sample pretreatment, 2) preliminary tests and chromatographic methods, 3) identification methods, and 4) developing technologies and analytical issues. The text is also current with new methodologies and contains numerous references within two years of its publication date. A comprehensive index and appendices are included as well.

The first section (Chapters 1 and 2) gives excellent descriptions of the nature and characteristics of abused drugs in solid dose form and in biological matrices. In-depth discussions on unintended impurities, intended combinations, counterfeit tablets, and characteristics of various biological samples, provide a comprehensive overview of the subjects. The authors go into great detail, discussing the specific applications of sample pretreatments.

Section Two (Chapters 3 to 6) covers preliminary tests and chromatographic methods. The authors give a brief overview on color tests but then focus on thin-layer chromatography, immunoassay, and chromatographic methods. The chapter on immunoassay is the most comprehensive of the book. Many of the figures and tables "illustrate at a glance" correlations, cross-reactivities, and assay specifics for many manufacturers of radio-, enzyme, fluorescence polarization, and particle immunoassays. The examination of quan-

titative data correlation between different immunoassays and gas chromatographic mass spectrometric analysis is very informative and appears to be comprehensive. Chapter 6, "Chromatographic Methods," gives equal weight to gas chromatography and high pressure liquid chromatography. This chapter is essentially a quick reference to any analytical approach, procedure or objective that an analyst may require for a target drug.

Section Three (Chapters 7 to 9) covers the three major identification methods: molecular, nuclear magnetic resonance (NMR), and mass spectrometry. The areas of UV-visible, infrared and fluorescence spectrophotometry, and NMR are addressed briefly. The chapter on mass spectrometry (Chapter 9) provides detailed mass spectral characteristics for many commonly abused drugs. The authors discuss various analytical approaches that include enhanced detection techniques and quantitative analysis criteria. Over 350 references complement this chapter.

Section Four (Chapters 10 to 12) addresses developing technologies and analytical issues. Chapter 11 brings to light the cutting-edge techniques and approaches that are being utilized in some of the world's leading forensic/clinical laboratories today. The areas of sample differentiation, isotope ratio mass spectrometry, and diastereoisomer/enantiomer analysis are covered. The references in Chapter 11 provide a virtual "Who's Who in Forensic Drug Chemistry." Chapter 12 gives a short and concise composition of test results interpretation for the clinical analyst. The authors include discussions on sample adulteration, unintended exposure, analyte stability, and "cut-off" levels.

The *Handbook of Drug Analysis: Applications in Forensic and Clinical Laboratories* should be mandatory reading for all forensic and clinical practitioners in training. However, the text is also very useful to the experienced analyst for exploring problem-solving avenues for most any analytical approach.

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