CONTENTS

1. List of Figures i-iv
2. List of Tables v-vi
3. Abbreviations vii-ix

Chapter: 1 Introduction 1-63

1.1 General Introduction
1.2 Classification of drugs
1.2.1 Chemical classification
1.2.2 Pharmacological Classification
1.2.3 Potential for Abuse Classification (DEA Drug Schedules)
1.2.4 Drugs classification based on the therapeutic effect
1.3 Drugs as environmental pollutants
1.4 Need of Therapeutic Drug Monitoring
1.5 Introduction to studied categories of drugs
1.5.1 Introduction to antiepileptics
1.5.2 Introduction to antidepressants
1.5.3 Introduction to quinolones and fluoroquinolones
1.5.4 Introduction to AHLs
1.6 Introduction to HPLC
1.6.1 Principle
1.6.2 Types of HPLC
1.6.2.1 Normal phase chromatography
1.6.2.2 Reversed phase chromatography (RPC)
1.6.2.3 Gel permeation chromatography
1.6.2.4 Ion-exchange chromatography
1.6.3 Instrumentation
1.6.3.1 Pump
1.6.3.2 Injector
1.6.3.3 Columns
1.6.3.4 Mobile Phase
1.6.3.5 Stationary phases
1.6.3.6 Detectors

1.7 Introduction to GC-MS
1.7.1 Principle
1.7.2 Instrumentation
1.7.2.1 Mobile phase
1.7.2.2 Injection ports and sample introduction
1.7.2.3 Columns
1.7.2.4 Detectors
1.7.2.5 GC and MS interface

1.8 Introduction to physical parameters
1.8.1 Retention factor (k)
1.8.2 Separation factor (α)
1.8.3 Efficiency factor (N)
1.8.4 Resolution equation (R_S)
1.8.5 Validation
1.8.5.1 Precision
1.8.5.2 Accuracy
1.8.5.3 Limit of detection
1.8.5.4 Limit of quantitation
1.8.5.5 Linearity
1.8.5.6 Range
1.8.5.6 Recovery

1.9 Introduction to sample preparation
1.9.1 Introduction to SPE
1.9.1.1 Introduction
1.9.1.2 Theory
1.9.1.3 Working
1.9.2 Introduction to MEPS
1.9.2.1 Introduction
1.9.2.2 Working of MEPS
1.9.2.3. Advantages of MEPS over other extraction techniques

References

Chapter: 2 Review of Literature

2.1 Methods used for the analysis of drugs
2.2 Application of pre-concentration techniques with HPLC/GCMS to antidepressants
2.3 Application of pre-concentration techniques with HPLC/GCMS to antiepileptics
2.4 Application of pre-concentration techniques with HPLC/GCMS to fluoroquinolones
2.5 Application of pre-concentration techniques with HPLC/GCMS to N-acyl homoserine lactones
2.6 Conclusions

References

Chapter: 3 Analysis of Antiepileptic Drugs using MEPS-HPLC-UV/GC-MS Systems

3.1 A new method for determination of antiepileptic drugs in human plasma and urine by using MEPS-HPLC-UV
3.1.1 Experimental
3.1.2 Results and Discussion
3.1.2.1 LC/UV Analysis
3.1.2.2 Development of a micro-extraction by packed sorbent procedure
3.1.2.3 Analysis of patient plasma and urine samples
3.1.2.4 Carryover and Matrix Effects
3.1.2.5 Comparison of Methods
3.1.3 Conclusions
3.2 A novel method for the analysis of antiepileptic drugs in human plasma and urine by using MEPS-GC-MS
3.2.1 Experimental
3.2.2 Results and Discussion
3.2.2.1. GC-MS Analysis
3.2.2.2. MEPS method development
3.2.2.3. Method Validation
3.2.2.4. Recovery
3.2.2.5. Analysis of patient plasma and urine samples
3.2.2.6. Carryover and Matrix Effects
3.2.3. Conclusions

References

Chapter: 4 Analysis of Tricyclic and Nontricyclic Antidepressants by MEPS-LC-UV/GC-MS 169-192

4.1 Introduction
4.2 Experimental
4.3 Results and Discussion
4.3.1. MEPS method development
4.3.2. LC-UV Analysis
4.3.3. GC-MS Analysis
4.4 Conclusions

References

Chapter: 5 Analysis of Quinolones using MEPS-HPLC-UV 193-213

5.1 Introduction
5.2 Experimental
5.3 Results and Discussion
5.3.1. Development of a Microextraction Procedure by Packed Syringe
5.3.2. Optimization of Chromatographic Conditions
5.3.3. Method Validation
5.3.4. Selectivity
5.3.5. Carryover and Matrix Effects
5.4 Conclusions

References
Chapter: 6 Analysis of N-Acyl Homoserine Lactones by Gas Chromatography-Mass Spectrometry

6.1. Introduction

6.2. Experimental

6.2.1. Chemicals and Reagents

6.2.2. Microorganism’s Growth Conditions and Sample Extraction

6.2.3. Sputum Sample Extraction

6.2.4. GC/MS Instrumentation and Conditions

6.3. Results and Discussion

6.3.1. Optimization of GC-MS Conditions

6.3.2. Method Validation

6.3.3. Real Sample Analysis

6.4. Conclusions

References

Summary

List of Publications