TABLE OF CONTENTS

Preface				
1.	Introduction	6		
	Basic concepts and principles			
	Theory of HPLC			
	3.1 Chromatographic column			
	3.1.1 Model of ideal linear chromatography based on the concept of the			
	theoretical plate	17		
	3.1.2 Dynamic models of chromatography	20		
	3.1.3 Chromatographic process in HPLC	24		
	3.1.4 Modelling of the elution curve shape	35		
	3.2 Extracolumn contributions to the elution curve broadening	37		
	3.3 Principles of distribution of substances between two phases	39		
	3.3.1 Adsorption	41		
	3.3.2 Distribution between two liquid phases	43		
	3.3.3 Ion exchange	44		
	3.3.4 Specific interactions of proteins	.46		
	3.3.5 Distribution according to the particle size	47		
4.	Selection and preparation of the stationary and the mobile phase	48		
	4.1 Selection of the column	49		
	4.2 Materials for the column packings	50		
	4.3 Microcolumns	53		
	4.4 Preparation and testing of columns	55		
	4.5 Selection of the mobile phase	58		
	4.6 Main chromatographic systems	63		
	4.6.1 Adsorption chromatography	63		
	4.6.2 Chromatography on chemically-bonded phases	65		
	4.6.3 Ion-exchange chromatography	76		
	4.6.4 Gel (size-exclusion) chromatography	79		
	4.6.5 Affinity chromatography	. 80		
5.	. Instruments and auxiliary equipment	84		
	5.1 Mobile phase reservoirs	85		
	5.2 Pumps	86		
	5.3 Apparatus for gradient elution	89		
	5.4 Sample injection devices	90		
	5.5 Pre-columns	93		
	5.6 Columns	93		
	5.7 Connecting parts	93		
	5.8 Equipment for thermostatting	94		
	5.9 Devices for deaeration of the mobile phase	95		
	5.10 Detection systems	95		
	5.10.1 Spectrometric detectors	97		

		5.10.2	Fluorescence detectors	98		
		5.10.3	Refractive index detectors	99		
		5.10.4	Electrochemical detectors	99		
			Other detector types	101		
		5.10.6	Combination of HPLC with highly efficient spectrometric techniques	101		
6.	Expe	erimenta	al techniques	106		
	6.1	Qualita	ative analysis	106		
	6.2	Quantit	tative analysis	108		
	6.3	Prepar	rative chromatography	113		
	6.4	Progra	ammed techniques	115		
		6.4.1	Programming of the mobile phase composition	115		
		6.4.2	Programming of the pressere or the mobile phase flow rate	118		
			Programming of temperature	118		
		6.4.4	Programming of the stationary phase composition (multidimensional			
			liquid chromatography)	120		
	6.5	Chemi	cal derivatization	124		
7.	Exa	mples o	f typical application	127		
	7.1	Analys	sis of nucleic acid components	127		
	7.2	Analys	sis of amino acids, peptides and proteines	128		
	7.3	Analys	sis of drugs	130		
	7.4	Analys	sis of environmental pollutants	130		
	7.5	Separ	ation of isomers	131		
	7.6	Analys	sis of high-molecular substances	132		
	7.7	Analys	sis of inorganic substances	133		
Li	List of symbols and abbreviations					