

Contents

Acknowledgements **xi**

Abbreviations **xiii**

Chapter 1 What is the Maillard Reaction? **1**

1	A Little History	1
2	Chemical Definition	1
3	The Maillard Reaction <i>in situ</i>	3
4	Analytical Food Chemistry – Challenges and Limitations	4
5	Analysing the Maillard Reaction in Food	6
6	Towards an Understanding of the Relationship between Food Qualities and Molecular Constitution	6
7	In a Nutshell	7
8	Further Reading	8
9	References	8

Chapter 2 Consequences of the Maillard Reaction in Food **9**

1	Measuring Particular Qualities of Food	9
2	The Maillard Reaction and Colour	9
3	The Maillard Reaction and Aroma and Flavour	12
4	The Maillard Reaction and Texture	13
5	The Maillard Reaction and Bioactivity	14
6	The Maillard Reaction and Nutrition	15
7	The Use of Model Systems	16
8	In a Nutshell	17
9	Further Reading	17
10	References	17

Chapter 3	Extraction of Maillard Reaction Products from Food	20
1	Introduction	20
2	What Information is Required?	20
3	Instrumental Constraints	21
4	Sampling Techniques for Soluble Molecules	22
5	Sampling Techniques for Volatile Molecules	23
6	In a Nutshell	29
7	Further Reading	30
8	References	30
Chapter 4	Gas Chromatography	33
1	Introduction	33
2	The Separation	34
3	Detection Methods	37
4	Getting Started – in a Nutshell	41
5	Further Reading	42
6	References	42
Chapter 5	Liquid Chromatography	44
1	Introduction	44
2	Separation Basics	44
3	The Art of Chromatography	49
4	Detection Methods	55
5	Getting Started – in a Nutshell	56
6	Further Reading	56
7	References	56
Chapter 6	Mass Spectrometry	59
1	Introduction	59
2	How does MS Work?	59
3	Ionisation Techniques	60
4	Mass Analysers	64
5	Hyphenated Techniques	68
6	Getting Started – in a Nutshell	71
7	Further Reading	72
8	References	72
Chapter 7	Electrophoresis	74
1	Introduction	74
2	Separation by Size	76
3	Separation by Charge	79

4	Separation by Size and Charge – a Second Dimension	83
5	Visualisation of Proteins	84
6	Beyond Electrophoresis – Further Analysis	85
7	Getting Started – in a Nutshell	85
8	Further Reading	87
9	References	87
Chapter 8 Capillary Electrophoresis		89
1	Introduction	89
2	How does CE work?	89
3	Separation Techniques	91
4	Detection	98
5	Protein Analysis	98
6	Getting Started – in a Nutshell	101
7	Further Reading	103
8	References	103
Chapter 9 New Methodologies, New Approaches		105
1	Introduction	105
2	Structural Elucidation of Purified Maillard Products	106
3	Probing an Impure Sample for Maillard Reaction Products	110
4	Expanding the Repertoire?	110
5	In a Nutshell	112
6	Further Reading	112
7	References	112
Subject Index		117

