

Pyrolysis - GC/MS Data Book of Synthetic Polymers

Pyrograms, Thermograms and MS of Pyrolyzates

TSUGE Shin, Emeritus Professor of Nagoya University, Japan

OHTANI Hajime, Nagoya Institute of Technology, Japan

WATANABE Chuichi, Frontier Laboratories Ltd., Fukushima, Japan



ELSEVIER

ISBN: 978-0-444-53892-5

PUB DATE: October 2011

LIST PRICE: \$295.00

DISCOUNT: Agency

FORMAT: Hardback

PAGES: 390

TRIM: 7.5w x 9.25h

AUDIENCE

Chemists, Analytical Chemists and Chemical Engineers, in polymer research. Academics and research students in these areas.

KEY FEATURES

- Offers Py-GC/MS data of conventional pyrograms and thermograms of the basic 163 kinds of synthetic polymers together with MS and retention index data for pyrolyzates, enabling quick identification
- Presents additional coverage of the pyrograms and their related data for 33 basic condensation polymers obtained by the thermally assisted hydrolysis and methylation technique
- All compiled data measured under the same experimental conditions for pyrolysis, gas chromatography and mass spectrometry to facilitate peak identification
- Surveyable instant information on two facing pages dedicated to the whole data of a given polymer sample

DESCRIPTION

This data book provides an extensive reference collection of the behavior of specific polymers during pyrolysis. It fills a big gap in the available standards and data on pyrolysis research, as there are no books that give the same combination of excellent analytical data with such a wide range of polymer systems that are useful to so many areas of multidisciplinary research. The data provided will be useful whenever a new polymer has to be analyzed in order to facilitate the identification or to confirm the results. The book also briefly reviews the instrumentation available in advanced analytical pyrolysis and offers guidance to perform this technique, effectively combining gas chromatography and mass spectrometry. Main contents are comprehensive sample pyrograms, thermograms, identification tables, and representative mass spectra (MS) of pyrolyzates for synthetic polymers. This edition also highlights thermally assisted hydrolysis and methylation techniques effectively applied to 33 basic condensation polymers.

TABLE OF CONTENTS

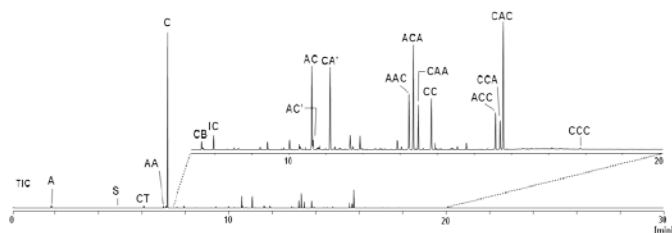
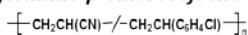
1. Preface
2. Introduction
3. Pyrograms and Thermograms of 163 High Polymers, and MS Data of the Major Pyrolyzates
4. Pyrograms for 33 Condensation Polymers and MS Data of the Major Pyrolyzates Obtained in the Presence of Organic Alkaline
5. Appendix Monographs and Reviews for Pyrolysis-GC of Polymers

Learn more at www.elsevierdirect.com/9780444538925
or contact your Elsevier customer service representative.

Sample left page (page 78)

Sample right page (page 79)

034 Acrylonitrile-*p*-chlorostyrene copolymer

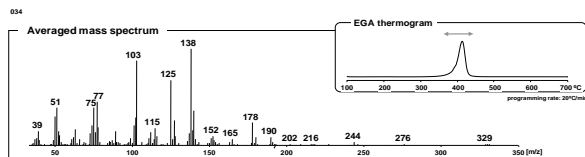


Peak Notation	Assignment of Main Peaks	Molecular Weight	Retention Index	Relative Intensity
A	acrylonitrile	53	570	2.1
S	styrene	104	889	0.1
CT	<i>p</i> -chlorotoluene	126	957	1.2
AA	C=C(CN)-C-C-CN (A dimer)	106	1056	1.1
C	<i>p</i> -chlorostyrene	138	1081	100.0
CB	<i>p</i> -chlorobenzaldehyde	140	1128	0.7
IC	4-chloroisopropylbenzene	152	1168	1.0
AC	C=C(CN)-C-C-PhCl	191	1562	6.3
AC'	C(PhCl)-C-C-CN	179	1558	0.7
CA'	C=C(PhCl)-C-C(CN)-C	205	1644	7.5
AAC	C=C(CN)-C-C(CN)-C-C-PhCl	244	2051	4.1
ACA	C=C(CN)-C-C(PhCl)-C-C-CN	244	2075	8.2
CAA	C=C(PhCl)-C-C(CN)-C-C-CN	244	2101	3.3
CC	C=C(PhCl)-C-C-PhCl (C dimer)	276	2179	4.2
ACC	C=C(CN)-C-C(PhCl)-C-C-PhCl	329	2597	2.9
CCA	C=C(PhCl)-C-C(PhCl)-C-C-CN	329	2629	2.4
CAC	C=C(PhCl)-C-C(CN)-C-C-PhCl	329	2657	9.7
CCC	C=C(PhCl)-C-C(PhCl)-C-C-PhCl (C trimer)	414	3144	0.4

* bonding hydrogen is omitted : PhCl represents C₆H₄Cl (4-chlorophenyl group)

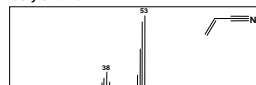
[Related Reference]

1) Okumoto, T., Tsuge, S., Yamamoto, Y., Taketchi, T. *Macromolecules* 1974, 7, 376.



(m/z range : 29 - 600 amu)

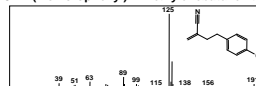
A : acrylonitrile



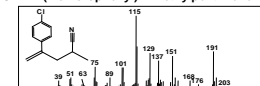
C : *p*-chlorostyrene



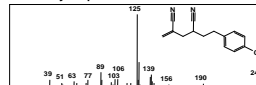
AC : 4-(4-chlorophenyl)-2-methylenebutanenitrile



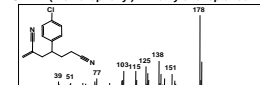
CA' : 4-(4-chlorophenyl)-2-methylpent-4-enitrile



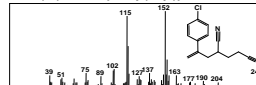
AAC : 2-(4-(4-chlorophenyl)-4-methylenebutanenitrile)



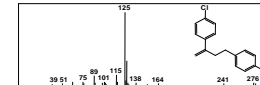
ACA : 4-(4-(4-chlorophenyl)-2-methyleneheptanenitrile)



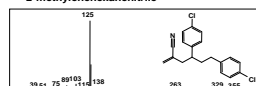
CAA : 2-(2-(4-(4-chlorophenyl)allyl)pentanenitrile)



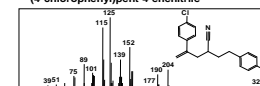
CC : 4,4'-(but-3-ene-1,3-diyl)bis(chlorobenzene) (C dimer)



ACC : 4,6-bis(4-(4-chlorophenyl)-2-methylenehexanenitrile)



CAC : 2-(4-(4-chlorophenyl)pent-4-enitrile)



- 91 -

Left Page:

- Sample number, polymer name, and chemical structure
- Pyrogram at 600 °C separated by the capillary separation column
- Peak assignment table together with molecular weight (MW), relative peak intensity and retention index (RI) data

Right Page:

- EGA thermogram under programming from 100 to 700 °C at a rate of 20 °C/min
- Average mass spectrum of the EGA thermogram around peak top
- Mass spectra of the top 10 major peaks

CUSTOMER SERVICE CONTACT INFORMATION

North America

Tel: +1 800 545 2522

Email: bookscustomerservice-usa@elsevier.com

Europe, Middle East, and Africa

Tel: +44 (0) 1865 844644

Email: eurobkinfo@elsevier.com

Australia and New Zealand

Tel: 1800 263 951 (Australia)

Tel: 0800 170 165 (Calling from NZ)

Email: customerserviceau@elsevier.com

Asia

Tel: +65 6349 0222

Email: asiabkinfo@elsevier.com

India

Tel: +91 120 467 9200/9300

Email: csindia@elsevier.com

Latin America, Mexico, Brazil and the Caribbean:

Tel: 1 314 453 7010

Email Latin America, Mexico:

USBKLatinAmerica@elsevier.com

Email Brazil, Caribbean:

USBKbracarib@elsevier.com