



BSI Standards Publication

Plastics — Determination of average molecular mass and mixture ratio of poly(ethylene glycol) and its derivatives by MALDI-TOF-MS

National foreword

This British Standard is the UK implementation of ISO 19929:2017.

The UK participation in its preparation was entrusted to Technical Committee PRI/21, Testing of plastics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2017.
Published by BSI Standards Limited 2017

ISBN 978 0 580 89838 9

ICS 83.080.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2017.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

**Plastics — Determination of average
molecular mass and mixture ratio
of poly(ethylene glycol) and its
derivatives by MALDI-TOF-MS**

*Plastiques — Détermination de la masse moléculaire moyenne et
du rapport de mélange du poly(éthylène glycol) et de ses dérivés par
MALDI-TOF-MS*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principles	3
5 Reagents	3
6 Apparatus	4
7 Procedure	5
7.1 General	5
7.2 Sample preparation	5
7.2.1 General	5
7.2.2 Preparation of polymer standard mixtures	6
7.2.3 Preparation of polymer/matrix/salt solutions	6
7.2.4 Deposition of the sample on the sample plate (target)	6
7.2.5 Preparation of biopolymer/matrix solutions	7
7.3 Instrument settings	7
7.4 Spectra recording	8
8 Data acquisition and processing	8
8.1 General	8
8.2 Calibration of mass axis	8
8.2.1 General	8
8.2.2 Calibration of mass axis using synthetic polymer standards	9
8.2.3 Calibration of mass axis using biopolymer standards	9
8.2.4 Self-calibration method	9
8.3 Generation of mass calibration curve	9
8.4 Calibration of intensity axis	9
9 Expression of results	10
9.1 Calculation of molecular mass distribution (MMD)	10
9.2 Calculation of the number-average molecular mass	10
9.3 Calculation of peak area	10
9.4 Constructing calibration curve for intensity	10
9.5 Calculation of mass ratio	11
10 Precision	11
11 Test report	11
11.1 General	11
11.2 Apparatus	11
11.3 Calibration	11
11.4 Results	11
Annex A (normative) Calibrants	12
Bibliography	13

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

Introduction

For quality control and research of polymeric materials, it is important to know the composition of polymer mixtures with different terminal groups. In contrast to traditional methods such as liquid chromatography, matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF-MS) is a rapid and effective method to characterize polymer mixtures because of its high mass resolution. It can also be applied to quantitation of mixtures of different polymers. Interlaboratory comparisons of quantitative MALDI-TOF-MS performed for mixtures of PEG and its derivatives can ensure standardized conditions of measurement. Standardization of quantitative MALDI-TOF-MS may promote increasing applications of this analytical technique.

