

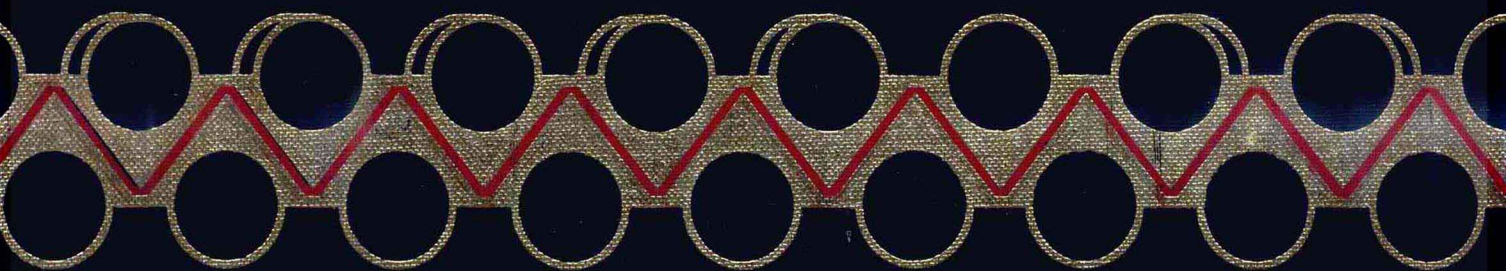
CONCISE

ENCYCLOPEDIA

OF POLYMER

SCIENCE AND

ENGINEERING



CONCISE ENCYCLOPEDIA OF POLYMER SCIENCE AND ENGINEERING

Jacqueline I. Kroschwitz, *Executive Editor*



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PREFACE

This compact desk reference contains all of the subjects covered in the 17 main volumes and the Supplement and Index Volumes of the world-renowned 2nd Edition of the *Encyclopedia of Polymer Science and Engineering*. The articles have been condensed by professional science writers, reviewed for accuracy by the original authors or their colleagues, and updated where necessary. This distillation, skillfully prepared to retain the key data, tables, and factual matter of the original, is a complete and self-contained encyclopedia. It is designed to serve as a ready-reference guide for students, scientists, engineers, and technologists seeking answers to questions on any aspect of polymer science and engineering.

This one million word version, like the ten million word larger work, provides both SI and common units, carefully selected key references for each article, and hundreds of tables, charts, figures, and graphs. Coverage includes every important sector, such as: polymeric materials, natural and synthetic; polymer properties, i.e. molecular, chemical, physical, electrical, mechanical, thermal and biological properties, morphology, compatibility, and stability; synthesis and reactions; characterization and analytical methods; physical processes; engineering; polymer processing; product fabrication; test methods; uses in adhesives, coatings, films, fibers, elastomers, plastics composites, and occurrence in natural materials; historical perspective; and economics.

Information from the Supplement and Index Volumes has

been included alongside the main-volume articles. Although specific reference to the articles in the original work is not always made, it should be understood that further details, specific bibliographic citations, and much wider coverage of any subject may be obtained by referring to the 19-volume edition.

The editors have also carefully preserved the tradition of citing related articles in the text (*see* and *see also* citations), as well as secondary entries or cross references which cite the synonym or entry term where a subject can be located. An Index of key terms provides further access to the contents where desired.

The complete Second Edition of the *Encyclopedia* has been called a "landmark publication" and a "milestone in polymer science." This concise version presents the essence of this monumental work in a useful daily tool comparable to a handbook or dictionary from which the comprehensive, authoritative, and lucidly written data become instantly available. This new encyclopedia has been developed over five years by the writers, authors, and Wiley editorial staff. Every effort has been made by the editors to provide a work that is unsurpassed in quality and accuracy. We hope we have succeeded and that this work will serve your reference needs for years to come.

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CONVERSION FACTORS, ABBREVIATIONS, AND UNIT SYMBOLS

SI UNITS (ADOPTED 1960)

A new system of measurement, the International System of Units (abbreviated SI), is being implemented throughout the world. This system is a modernized version of the MKSA (meter, kilogram, second, ampere) system, and its details are published and controlled by an international treaty organization (The International Bureau of Weights and Measures) (1).

SI units are divided into three classes:

Base Units

length	meter [†] (m)
mass [‡]	kilogram (kg)
time	second (s)
electric current	ampere (A)
thermodynamic temperature [§]	kelvin (K)
amount of substance	mole (mol)
luminous intensity	candela (cd)

Supplementary Units

plane angle	radian (rad)
solid angle	steradian (sr)

Derived Units and Other Acceptable Units

These units are formed by combining base units, supplementary units, and other derived units (2–4). Those derived units having special names and symbols are marked with an asterisk in the list below:

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>	<i>Acceptable equivalent</i>
*absorbed dose	gray	Gy	J/kg
acceleration	meter per second squared	m/s ²	
*activity (of ionizing radiation source)	becquerel	Bq	1/s

[†] The spellings “metre” and “litre” are preferred by ASTM; however, “-er” is used in the *Encyclopedia*.

[‡] “Weight” is the commonly used term for “mass.”

[§] Wide use is made of “Celsius temperature” (*t*) defined by

$$t = T - T_0$$

where *T* is the thermodynamic temperature, expressed in kelvins, and *T*₀ = 273.15 K by definition. A temperature interval may be expressed in degrees Celsius as well as in kelvins.