

Book Review

FLAME RETARDANT POLYMERIC MATERIALS, Volume 3

Edited by M. Lewin, S. M. Atlas and E. M. Pearce

Plenum Publishing Corporation, New York, 1982, \$ 35

Volume 3 of this highly opportune series has recently (1982) been issued following the publishing of Volumes 1 (1975) and 2 (1978).

The book consists of five chapters written by acknowledged experts in this field of science.

Chapter 1: The flame retardation of polyolefins. In the first chapter J. Green considers methods of flame retardation of polypropylene, low-density polyethylene, high-density polyethylene, cross-linked polyethylene, ethylene-propylene copolymer, rubber, and some hydrocarbon polymers. He surveys the methods for evaluating the efficiency of flame retardation.

Having a separate chapter dealing with the study of polyolefins is well justified by enormous increase in their use in recent years. This chapter describes the most important information, though a list of more than 16 references with publications from later than 1978 might have been included.

Chapter 2: Methods for reduction of smoke from burning polymers, written by D. F. Lawson.

It is well known that smoke generation is one of the hazards associated with flammability, but this has received attention only very recently.

The author surveys technological processes capable of decreasing smoke generation from polymeric materials. He gives detailed consideration to the factors retarding smoke generation and attempts to forecast the development trends of the future.

The structure of this chapter is quite clear and consequent. It is especially noteworthy that, after reviewing 296 literature references, the author briefly summarizes his own views in the section "Summary and Conclusions".

Chapter 3: Experimental evaluation of flammability parameters of polymeric materials, written by A. Tewarson.

This chapter has several purposes: first, with the aid of the measuring technique developed by the author it considers the influence of the experimental conditions on the flammability of fuels. The experimental results obtained in this way provide great help to users in qualifying the materials and obtaining input parameters for fire modelling.

After describing the instrument, the author defines and describes the measuring principle and the following parameters: ignition, mass loss rate in pyrolysis and combustion of polymers, mass generation rate of products, heat release rate, optical trans-

mission through the mixture of pyrolysis-combustion products and air, generation of toxic compounds, and fire extinction.

The editors of the series deserve credit for including this work (mainly of a theoretical character and requiring careful understanding) as a separate chapter of the book. Dr. Tewarson attempts the physico-chemical treatment of problems of flame retardation and determines relative flammabilities from the results obtained with his instrument.

Chapter 4: Flammability evaluation methods for textiles, written by J. F. Krasny.

The author carefully and thoroughly presents different measuring techniques applied to textiles on the basis of 207 references. These techniques involve the following:

Evaluation methods for fabrics which are expected to undergo self-extinction.

Standards for both self-extinguishing and flammable fabrics.

Test methods for flammable fabrics.

Ignition time tests.

Heat evolution measurements.

Effects of laundering, soiling and weathering on flammability.

OI and other research methods.

Evaluation methods for specific end-use items.

Thermal behavior of textile materials.

A study of this chapter is of great use for experts compiling standards and for specialists working in the field of quality and control.

Chapter 5: The analysis of polymers and polymer degradation products by mass spectrometry, written by S. C. Israel.

The author describes the most recent technique of mass spectrometric analysis: he examines the advantages and limitations of the method with scientific thoroughness. Elaborating 157 references, the author presents the advantageous applicability of mass spectrometry to flame retardation.

Again, it is a credit to the editors that this work was chosen as a chapter of the book.

The execution of the book is satisfactory. The Figures and Tables are clear and understandable and almost free of misprints.

The reader will surely hope that the editors are already working on the compilation of Volume 4.

J. Simon