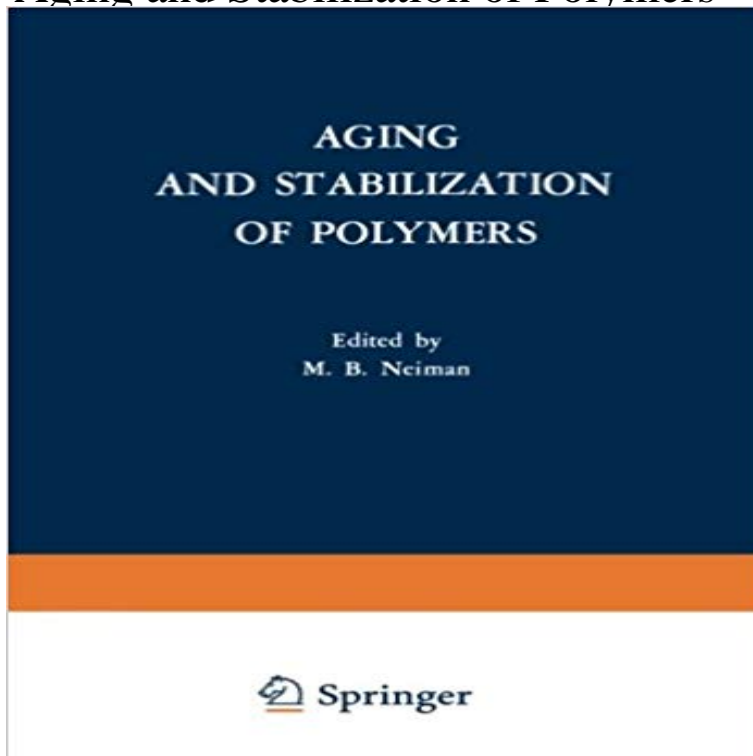


Aging and Stabilization of Polymers



The need for a broad development of the production of polymer materials has become evident. All these materials are subject to various types of aging (destruction); hence, stabilizers which permit the storage, reprocessing, and use of polymer materials without any appreciable change in their properties must be introduced into them. In recent years, this problem of stabilizing polymers has attracted the attention of many scientists and technologists, both in the USSR and abroad. The scientific basis of the foreign studies will be found in a number of theoretical premises, but chiefly the theory of chain reactions with unbranched chains. In the Soviet Union, the concepts of Academician N. N. Semenov on chain reactions with degenerate branches have become the starting point of theoretical studies of the stabilization and destruction of polymers. Soviet scientists have developed a theory of critical concentrations of antioxidants and have shown that the processes of stabilization have a very complex chemical character. The nature of the polymers themselves greatly affects these processes and consequently, different stabilizers are required for polymers of different structures. In addition, it has been shown that the antioxidants used thus far can not only cause chain termination, but can also initiate oxidation and give rise to degenerate branches.

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Some problems related to polymer aging and stabilization are discussed. Several experimental and theoretical procedures are outlined and