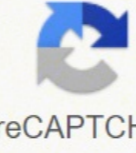
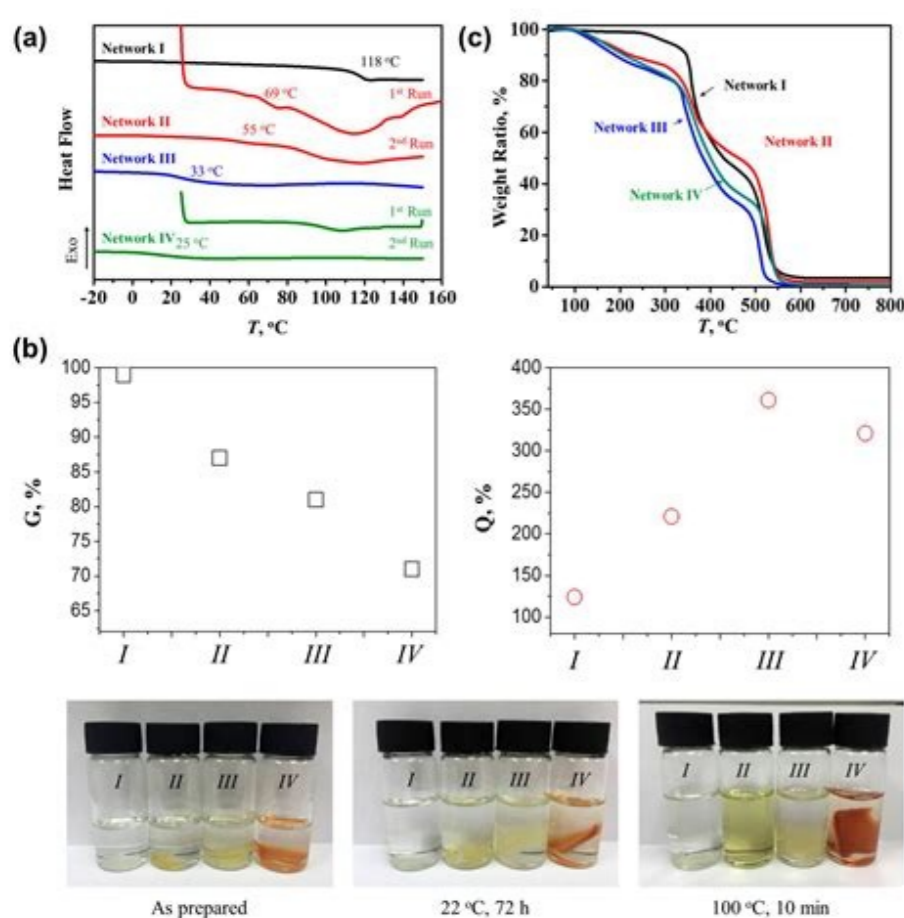
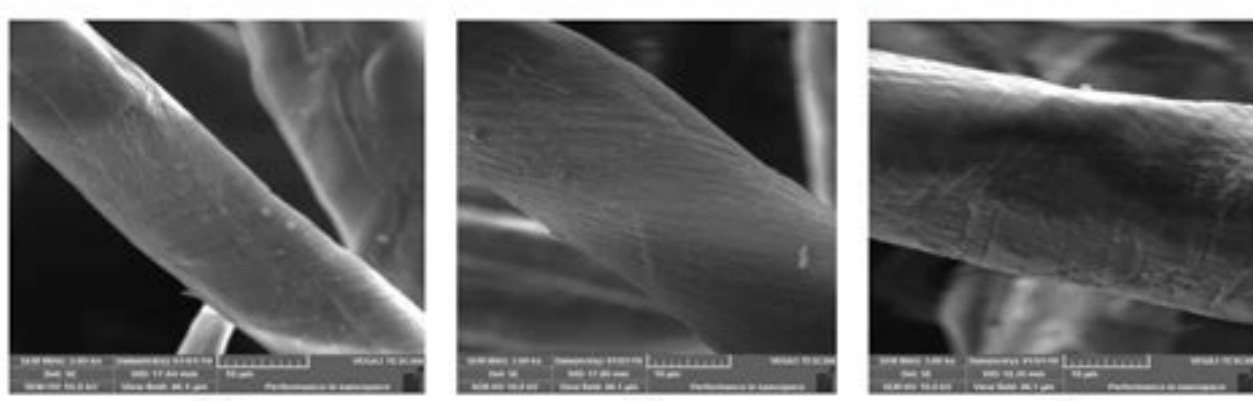


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Polymer Reinforcement
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16 Thermosets¹

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16.1 Introduction

16.1.1 Thermoset Materials

The world of thermoset materials is characterized by a high degree of both diversity and complexity, often difficult for non-experts to oversee [1]. Let us first ask ourselves what thermoset materials have in common. Polymeric materials are divided into two classes, thermoplastic and thermosetting materials. The term "thermoplastic" refers to the ability of these polymers to become plastic, that is, to melt and flow upon heating. In terms of viscoelasticity, a thermoplastic material can be hard and elastic at room temperature, but it behaves like a liquid when heated to a certain higher temperature. The expression "thermoset" or "thermosetting" is sometimes erroneously understood to be exclusively a material which "sets" (becomes hard and elastic) upon heating, but there are many examples of thermoset materials which have "set" without a temperature trigger, for example through irradiation (see Section 16.8.5). For the discussions in this chapter, the term "thermoset" will merely refer to the inability of this class of polymeric materials to behave like a liquid when heated. A thermosetting material can be hard and elastic at room temperature and be heated above its glass transition temperature to become "softer", and deformable. The deformation, however, will be transient rather than permanent; the softened material is still fully elastic and behaves like a rubbery material.

¹ The symbols used in this chapter are listed at the end of the text, under "Notation".

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Please help us to share our service with your friends. We need your help to maintenance this website. Starting with polymer chemistry and thermodynamics, the book goes on to deal with measurement, control, and characterization, before tackling process development, safety issues, scale-up, and modeling. It concludes with emerging processes. To keep our site running, we need your help to cover our server cost (about \$400/m), a small donation will help us a lot. We are a non-profit group that run this website to share documents. You can download the paper by clicking the button above. This first book dedicated to all aspects of the field presents our current knowledge in its entirety, covering the necessary disciplines and processes involved - from the monomer to the final product. Thank you for interesting in our services. The impulse for this book comes from the Working Party on Polymer Reaction Engineering of the European Federation of Chemical Engineering, and internationally recognized experts from different fields in industry and academia have come together to put their knowledge in writing. With its unparalleled depth of coverage, this will be the definitive reference on this topic for years to come. With an international editor and author team from academia and such leading chemical companies as Bayer, BASF and DuPont, the text adopts a multidisciplinary approach and a practical point of view. 11, No. 3, pp. 2003 Reaction kinetics in polymer melts POLYMER ENGINEERING GRADUATE PROGRAM M.E.(Polymer Engineering) Loading PreviewSorry, preview is currently unavailable. There is nothing like colleagues' comments to recommend a book: 'This handbook is an excellent idea since there is a gap in the literature especially concerning the significant research and development that has recently been carried out in this field.' 'Authors and editors are active academic and industrial polymer reaction engineers - among the best in the field.' 'In my opinion there is a definite need because there is no similar publication available in English covering engineering aspects.' Polymerization is the process by which polymers are manufactured, and during the polymerization process, some chemical groups may be lost from each monomer, and the polymer does not always retain the chemical properties or the reactivity of the monomer unit (Rudin, 1999;From: Handbook of Industrial Hydrocarbon Processes (Second Edition), 2020 Ultrasound-induced polymer reaction engineering in highpressure POLYMER REACTION ENGINEERING Vol.

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