Thermoplastic

Subjects: Polymer Science

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A thermoplastic is a polymer that softens on heating and hardens on cooling, and that can be reshaped repeatedly because its chains are held by secondary interactions rather than by a covalent network. The transition that enables this behaviour is either the glass transition or the crystalline melting point, depending on the material [1]. Processing methods are chosen to match the viscosity and the thermal stability, and the melt index serves as a practical indicator of flow [2]. The absence of crosslinks means the material can be recycled, but it also means that creep and solvent resistance are inferior to those of a thermoset [3]. Blending two thermoplastics or adding a rubbery phase is the standard way to improve toughness without replacing the base polymer [4].

melt processing | glass transition | crystallinity | melt index | creep | polymer blend | recycling

References

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