PVC (Polyvinyl Chloride)

Subjects: Polymer Science

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PVC (polyvinyl chloride) is a commodity thermoplastic produced by the free-radical polymerisation of vinyl chloride, and it is the third most produced synthetic polymer. Because the chains interact strongly, the unplasticised resin is rigid and is processed with a high level of lubricant and thermal stabiliser [1]. Adding a plasticiser inserts small molecules between the chains and lowers the glass transition, converting the rigid material into a flexible one, and the plasticiser content can reach forty percent of the formulation [2]. The polymer is thermally unstable above roughly a hundred and fifty degrees, losing hydrogen chloride and forming conjugated sequences that discolour the part, so the stabiliser system is essential [3]. Concern about the migration of phthalate plasticisers has shifted the industry towards higher-molecular-weight alternatives [4]. Mechanical recycling is limited by the mixed additives in post-consumer waste, and the chlorine content complicates any thermal route [5].

vinyl chloride | plasticizer | thermal stabilizer | dehydrochlorination | rigid pipe | phthalate | glass transition

References

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