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Production of Rubbery Materials from Recycled Thermoplastic by Chemical Modifications as a New Method for Thermoplastic Recycling

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Comparing to thermoplastic polymers, curable rubbers could have lower molecular weight and viscosity, which may be a necessity for their processing. However, compounding and curing of rubbers can provide the necessary mechanical properties for them after shaping and curing. So recycled thermoplastics that have less molecular weight comparing to their original polymers could be still used as raw materials for rubber production by chemical modification. In this work recycled high-density polyethylene degraded in different conditions, are used for production of chlorinated and chlorosulfonated polyethylene with different contents of chlorine and sulfur. Produced rubber from new and recycled HDPE are compounded and curried and their curing properties and their mechanical properties after curing are obtained. Comparison of obtained results for produced rubber from new and highly degraded HDPE show that initial degradation does not have much negative effects on final properties of produced rubber and so recycled polyolefin can be used as raw materials for production of chlorinated and chlorosulfonated rubbers.