

PRIORITIZED THEME / TECHNOLOGY THEME

Development of recyclable natural rubber materials using on-demand degradable cross-linker

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Summary :

Cross-linked natural rubber exhibits unparalleled mechanical properties based on strain-induced crystallization behavior and, therefore, no alternative material have been developed for car tire to date. The cross-linked natural rubber materials are hardly degradable, and only recyclable via thermal recycling process. This research aims to develop recyclable natural rubber materials by cross-linking with degradable peptide cross-linkers. Peptide sequences of the cross-linker will be rationally designed for the selective degradation by specific reagents such as reactive oxygen species (ROS) or proteases. Novel natural rubber materials with the cross-link/de-cross-link systems will offer chemical recycling of tires for future sustainable society.

