



Self healing polymer The material with the ability to heal back on its own



Room-temperature self-healing elastomers based on aromatic disulfide metathesis

Starting from common polymeric materials Cidetec has achieved the goal of getting self-healing elastomers through a simple and inexpensive approach.

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"Self-healing elastomer and process for its preparation"

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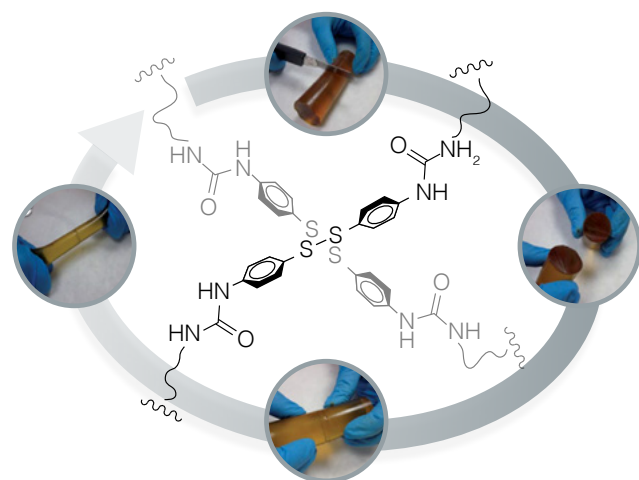
"A self-healing, reprocessable and recyclable crosslinked polymer and process for its preparation"

Concept

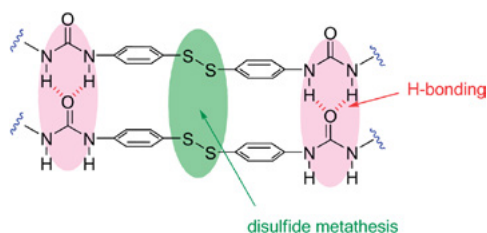
A particularly useful approach to generate self-healable polymers has been the introduction of reversible or exchangeable bonds into the polymer network.

The idea behind this is to reconnect the chemical crosslinks which are broken when a material fractures, restoring its integrity.

A commercially available and cost competitive diamine hardener is effectively used as a dynamic crosslinker for the design of self-healing poly(urea-urethane) elastomers, which show quantitative healing efficiency at room-temperature, without the need for any catalyst or external intervention.



The remarkable self-healing ability of this system could be attributed to two structural features, which are present in this unique crosslinking unit: (i) the aromatic disulfide which is in constant exchange at room temperature and (ii) two urea groups, capable of forming a quadruple H-bond.



Opportunities

The self-healing polymer offer a wide scope of commercial applications thanks to its capacity to improve the security and duration of many plastic parts, for example in cars, houses, electrical components and biomaterials.

The fact that poly(urea-urethane)s with similar composition and properties are already used in many products makes this system very attractive for a fast and easy implementation in real industrial applications.



AUTOMOTION



CONSTRUCTION



ELECTRICAL
COMPONENTS



BIOMATERIALS



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