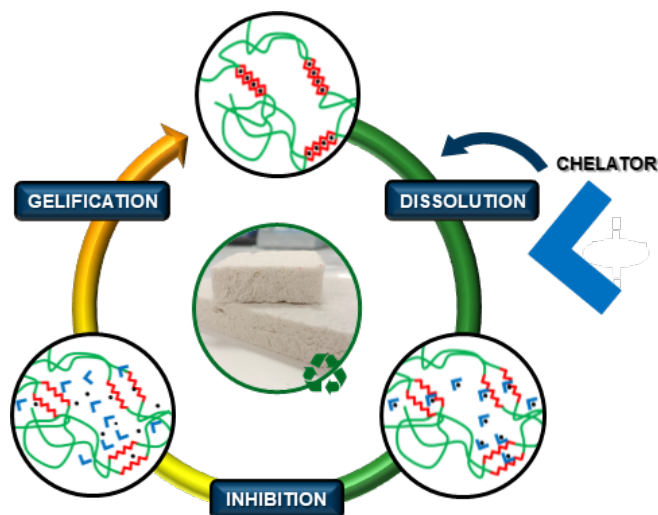




**UNIVERSITÀ
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METHOD TO RECYCLE MATERIALS OBTAINED BY GELATION

Method for the functional recycling of materials based on polymeric matrices with polymer-counterion ionic junctions.



Category:

Engineering

Patent Ownership:

UNIVERSITÀ DI TRIESTE

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Licensing Availability:

Available

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Brief description

This invention concerns a functional, efficient and low-temperature method of recycling composite materials whose matrix is formed by ionic interaction between an ionic polymer and a counterion. More specifically, the utilization of a water solution containing a chelating agent allows the selective sequestration of the counterion that forms the reticulant junctions. The compound matrix is thus dismantled and the material, which is now in a liquid form, may be processed. The inhibition of the chelating agent by change of pH makes the counterion available again, allowing the reticulation of the matrix. The material thus recycled, if processed in the same conditions as the original material, maintains its functional properties. The presence of the deactivated chelating molecule within the matrix of the recycled material facilitates further functional recycling with the abovementioned method, making it unnecessary to add more chelating agent. The patent includes the parameters needed for the material to be recycled with this method (structure of the matrix and chemical composition) and the parameters of the recycling process.

Innovative aspects and applications

Polymers with an ionic reticulation, especially polysaccharides, can find notable applications in fields such as pharmaceuticals, the food industry, biomedicine and constructions (thermoacoustic isolation). Nevertheless, there is little interest in finding an alternative solution to the disposal of materials based on these polymers, which limits their "utilization life span." The process

described in this patent is therefore meant not only to lengthen their functional life, but also, at the same time, to reduce the environmental and financial impact coming from the production of new materials from virgin raw materials.

Main advantages

- ✓ Inexpensive
- ✓ The recycling process does not damage the polymer
- ✓ Once the main matrix is dismantled, the material is completely workable, and the initial composition can be changed to improve/modify the properties of the final material
- ✓ The recycled material can easily go through further recycling
- ✓ The functional properties of the material can be maintained

Potential market

Sectors of the construction industry, the food industry, biomedicine and pharmaceuticals that use/develop materials based on a matrix with ionic interactions.

Development status

The process was lab tested on a thermally insulated and sound-absorbing compound. The functional characteristics are maintained in the material recycled with the abovementioned method.

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