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## Patent Search

Invention Title	METHOD FOR PRODUCTION OF FOUR-DIMENSIONAL SHAPE-MEMORY COMPOSITES USING MULTIPLE MATERIALS
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### Abstract:

The present invention discloses a method for production of four-dimensional shape-memory composites using multiple materials. In the present invention, the method herein allows for the restoration of a triple-shape polymer composite by influencing the necessary parameters for recovery. This involves a shape memory composite containing a shape memory polymer network with phase-separated switching segments and a magnetic material embedded within it. Accompanied Drawing [FIGS. 1

## Complete Specification

Description:[001] The present invention generally relates to the field of four-dimensional shape-memory composites. The present invention relates to shape memory composites and, more specifically, to shape memory composites with a hierarchical structure at multiple levels. The invention also encompasses a method for preparing these multilevel hierarchy shape memory composites. The invention more particularly relates to a method for production of four-dimensional shape-memory composites using multiple materials.

### BACKGROUND OF THE INVENTION

[002] The following description provides the information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[003] Further, the approaches described in this section are approaches that could be pursued, but not necessarily approaches that have been previously conceived or pursued. Therefore, unless otherwise indicated, it should not be assumed that any of the approaches described in this section qualify as prior art merely by virtue of their inclusion in this section.

[004] Four-dimensional shape-memory composites (4D-SMCs) refer to composite materials that exhibit shape-memory behavior in response to external stimuli. These materials are capable of changing shape in a predetermined manner over time when subjected to specific triggers, such as heat, light, or moisture. Unlike traditional shape memory materials that exhibit shape change in three dimensions (3D), 4D-SMCs incorporate an additional dimension of time.

[005] In the prior art, there are known materials referred to as "shape memory polymers" (SMPs) that undergo a transition in shape from a temporarily fixed shape to a permanent shape (PS) following a prior thermo-mechanical treatment, known as "programming," triggered by a suitable stimulus. Typically, the shape memory effect

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