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Elastic shape memory polymeric materials and their potential applications in comfort fitting for flexible wearable items


The shape memory effect (SME) refers to the capability of a piece of pre-deformed material to return its original shape, but only at the presence of the right stimulus. Typical stimuli include temperature variation (via either heating or cooling), chemicals, and light etc. The materials have such a feature are called shape memory materials (SMMs). We have seen a number of shape memory polymers at present. However, most of them are not elastic enough for flexible wearable items, such as shoes, at room temperature. We have recently developed a series of highly elastic (tailorable) shape memory polymeric materials to get rid of this problem, and furthermore, the items, such as shoes, made of this type of material can be programmed for comfort fitting

at body temperature for each individual. Hence, we are now able to realize customized fabrication at a low cost in a DIY manner. In this talk, we will introduce the major features of such materials, and show their potential applications in comfort fitting of wearable items.

Biography

Wei Min Huang is currently an Associate Professor (tenured) at the School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore. With over 20 years of experience on various shape memory materials (alloy, polymer, composite and hybrid), he has published over 180 papers in journals, such as Accounts of Chemical Research, Advanced Drug Delivery Reviews, and Materials Today, and has been invited to review manuscripts from over 200 international journals (including Progress in Polymer Science, Nature Communications, Advanced Materials, and Advanced functional materials, etc), project proposals from American Chemical Society, Hong Kong Research Grants Council, etc, and book proposals from CRC and Elsevier. He has published two books (Thin film shape memory alloys – fundamentals and device applications, Polyurethane shape memory polymers) and is currently on the editorial board of over two dozens of international journals.

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