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# Stretchable and self-healable double-network ionogel with strong adhesion and temperature tolerance for information encryption

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| 摘要 | Recently, hydrogels with adjustable mechanical properties have been developed for information security applications. However, the defects such as easy drying and inferior resistance to extreme temperatures limit their extended applications. Herein, a fluorescent double-network ionogel doped with imidazolemodified carbon quantum dots (CQDs) is constructed by the dynamic covalent cross-linking of chitosan with glutaraldehyde and chemical cross-linking of acrylamide in 1-ethyl-3-methylimidazolium chloride (EMIMCl). The ionogel exhibits high thermal stability and good resistance to high and low temperatures. In addition, the as-prepared ionogel possesses good viscoelasticity with high elastic modulus (G', similar to 10(5) Pa) and a viscosity of similar to 10(4) Pa.s. Attributed to the excellent stretchability, durability and self-adhesion in a wide operating temperature range, the ionogel has been successfully constructed to a mechanochromic fluorescent device for the reversible encryption and decryption of the information. Dual stimuli of UV light and force are required to reveal the hidden information. Besides, the dynamic Schiff base bonds formed by amine groups of chitosan and aldehyde groups of glutaraldehyde allow the ionogel to quickly repair damages without external stimulation, prolonging its service life. Therefore, this work reports a new strategy for the preparation of soft materials for more secure information encryption by using high-performance ionogels. |
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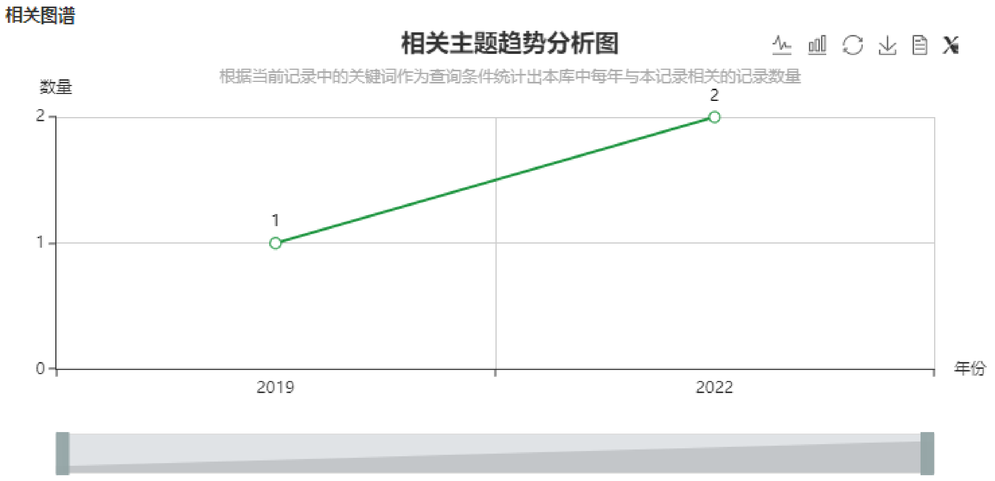


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