Self-Healable and Self-Powered Graphene-based Polymer Composites for Strain Sensors

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Abstract

Smart electronic devices have become very attractive in recent years with the rapid development of science and technology and graphene-polymer-based strain sensors come to the forefront due to their significant advantages over semiconductors and metals such as high flexibility, low-cost fabrication [1]. In addition, graphene-polymer-based strain sensors are preferred regarding to their self-healing, self-powered capabilities [2]. Noncovalent interactions such as hydrogen bonding, electrostatic, hydrophobic and host-guest interaction plays a key role in imparting these properties to strain sensors [3]. In this study, the effect of intermolecular interactions on self-healing properties was evaluated.

References

[1] Xiao-Lu Xu, Shun-Xin Li, Ying Yang, Xiang-Chao Sun, Hong Xia, High-performance strain sensor for detection of human motion and subtle strain by facile fabrication, Measurement, 189 (2022)110658.
[2] Yang Lu, Manik Chandra Biswas, Zhanhu Guo, Ju-Won Jeon, Evan K. Wujcik, Recent developments in bio-monitoring via advanced polymer nanocomposite-based wearable strain sensors, Biosensors and Bioelectronics, 123 (2019) 167-177.
[3] Lei Zhai, Ameya Narkar, Kollbe Ahn, Self-healing polymers with nanomaterials and nanostructures, Nano Today 30 (2020) 100826.

Figures

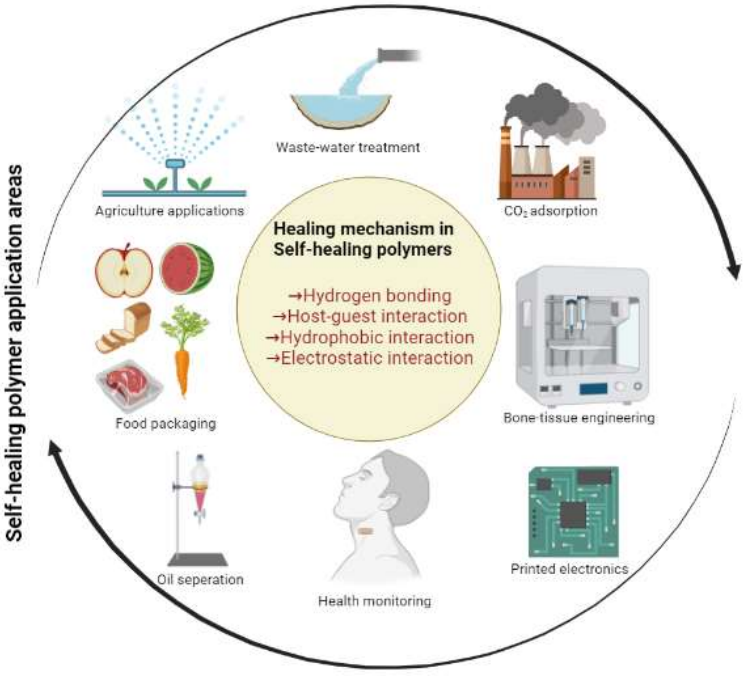

Figure 1: Noncovalent interaction in self-healing polymers and their application areas