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Highly sensitive and wearable capacitive pressure sensors based on PVDF/$BaTiO_3$ composite fibers on PDMS microcylindrical structures

Yang, Chii-Rong[a]; Lin, Ming-Feng[a]; Huang, Chun-Kai[a]; Huang, Wei-Chia[b]; Tseng, Shih-Feng[c] ✉; Chiang, Hsin-Han[d] ✉

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[a] Department of Mechatronic Engineering, National Taiwan Normal University, Taipei, 106209, Taiwan
[b] Department of Electrical Engineering, National Taiwan Normal University, Taipei, 106209, Taiwan
[c] Department of Mechanical Engineering, National Taipei University of Technology, Taipei, 106344, Taiwan
[d] Department of Vehicle Engineering, National Taipei University of Technology, Taipei, 106344, Taiwan

Краткое описание

This study developed a novel high-sensitivity flexible capacitive pressure sensor by combining $BaTiO_3$-doped polyvinylidene fluoride electrospinning fibers and polydimethylsiloxane microcylindrical structures as the dielectric layer. The flexible electrode formed by the graphene/PI film was assembled into a flexible capacitive pressure sensor, and formed a sandwich-like structure. The proposed sensor could obtain more capacitance variations and improve its sensitivity through composite deformation of electrospinning fiber and microcylindrical structure under pressure. The developed flexible capacitive pressure sensor has a high sensitivity of 5 kPa^{-1}, fast response and release time of 25 and 50 ms, ultralow detection limit of 0.11 Pa, and more than 10000- and 5000-times compressions/bending cycling test without any signal attenuation for the high durability and high reliability. The results of this study proved that the sensors have excellent performance, and can be applied on wearable devices for human pulse monitoring and acoustic detection. © 2022 Elsevier Ltd

Ключевые слова автора

Electronic skin system; Electrospinning fiber; Flexible capacitive pressure sensor; Human-machine collaboration; Microcylindrical structure

Включенные в указатель ключевые слова

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Tseng, S.-F.; Department of Mechanical Engineering, National Taipei University of Technology, Taipei, Taiwan; эл. почта:tsf@ntut.edu.tw

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