

**Figure 1. Fabrication Schematic diagram of the composite film and flexible pressure sensor.** (a) The fabrication of MXene/PDA composite film; (b) optical image of MXene/PDA composite film; (c) The fabrication of the flexible pressure sensor. (d) The application scenarios of the flexible pressure sensor in human health detection.



**Figure 2**. **Characterization of the MXene/PDA composite film.** (a) (b)SEM and (c) TEM images of MXene/PDA composite film. (d) XRD patterns of MXene/PDA composite film with different ratios. (e) FTTR spectra of the MXene/PDA composite film at a ratio of MXene:DA=1:1. (f) XPS survey spectra of MXene/PDA composite film. High-resolution XPS spectrum of Ti 2p, C 1s, O 1s and F 1s.



**Figure 3.** (a) and (b) Sensing properties illustration of the MXene/PDA-based flexible pressure sensor; The electronic and sensing performances of MXene/PDA biocomposite film-based pressure sensor: (c) I-V curves of flexible sensing devices based on MXene/PDA under different pressures, (d) I-T curves of MXene/PDA-based flexible sensing devices at different pressures, (e) I-T curve under tiny pressure (f) Response and recovery curve of flexible sensing device based on MXene/PDA at P=0.36 kPa, (g) Linear sensitivity at a wide pressure range of 0.18-6.20 kPa, (h) The detailed durability performance under a pressure of striking. (i) Comparison of pressure-sensitive respones of flexible pressure sensor. [14, 32, 33, 37-42]



**Figure 4**. **Health monitoring application.** (a) Schematic diagram of the the flexible and biocompatible intelligent system for health monitor. (b) Response of the MXene/PDA film-based flexible pressure sensor in monitoring finger bending. (c) The sensing performance of human wrist pulse. Single pulse waveform extracted from (c). (d) The sensing performance of the strain sensor was recorded during the session, left: repeat the word "flexible"; right: repeat the word "carbon". (e) Sensing performance changes when the eyebrows are raised. (f) The circuit diagram of MXene/PDA-based pressure sensor. Optical image of LED lights brightness changes with the pressure applied to the flexible pressure sensor based on MXene/PDA.