

Figure S3 Schematic diagram of barb structure and dome-shaped structure. Compared with the micro dome-shaped electrodes, the unique barb structure of BMS electrodes can maintain a larger contact area with the skin. The pressure of BMS electrodes on the skin is less under the same external pressure, which has a significant comfort of use.

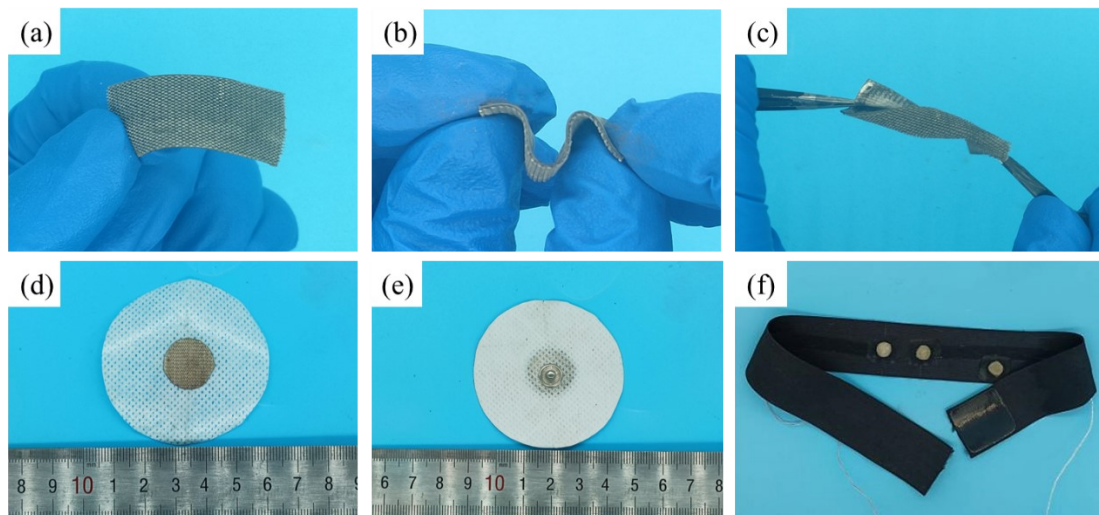


Figure S4 Optical photograph of (a) original TPU BMS film, TPU BMS film under (b) bending and (c) twisting, and optical photograph of EEG electrode patch (d) front view and (e) back view, and EEG testing headband.

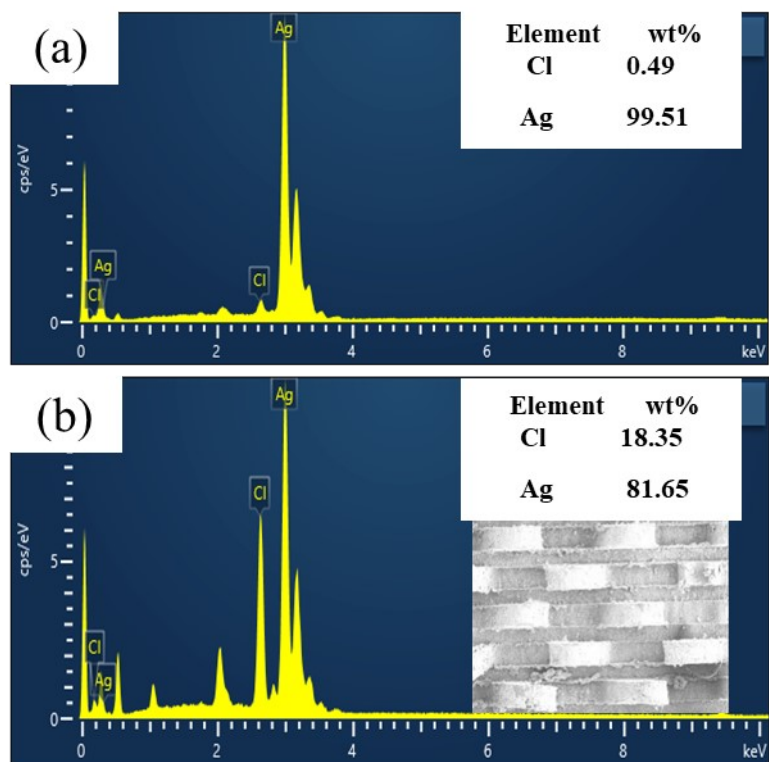


Figure S5 Characteristic X-ray energy spectra (a) before chlorination and (b) after chlorination

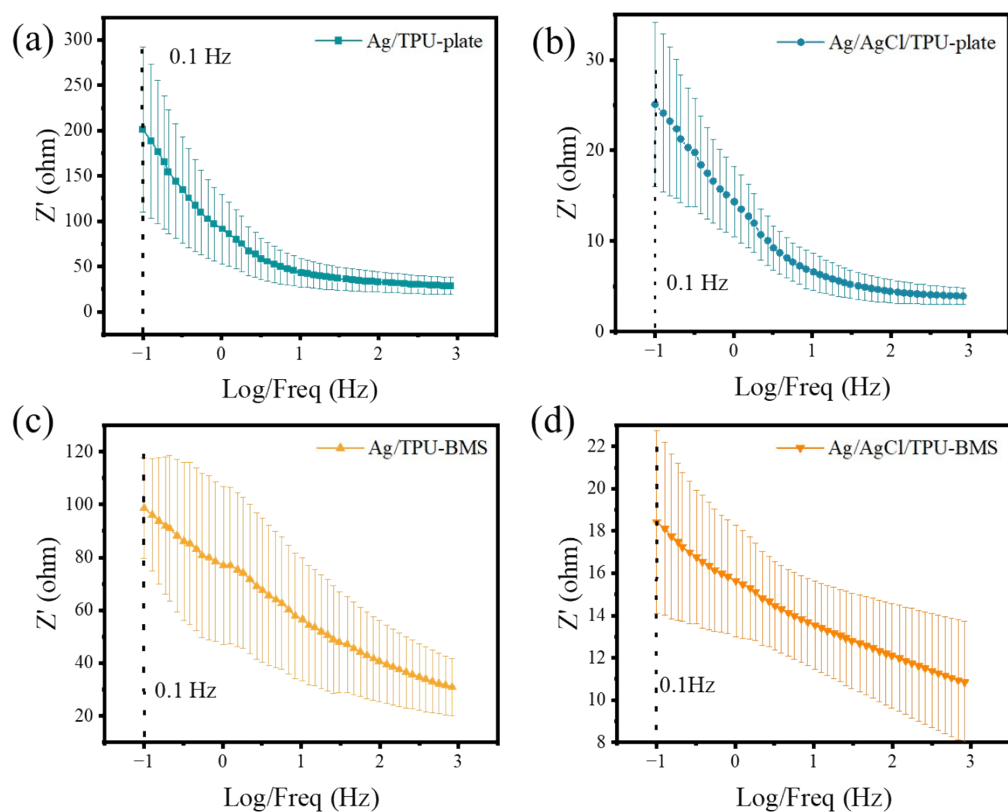


Figure S6 Electrode electrolyte interface: impedance-frequency curve (a) Ag/TPU-plate, (b) Ag/AgCl/TPU-plate, (c) Ag/TPU-BMS, (d) Ag/AgCl/TPU-BMS

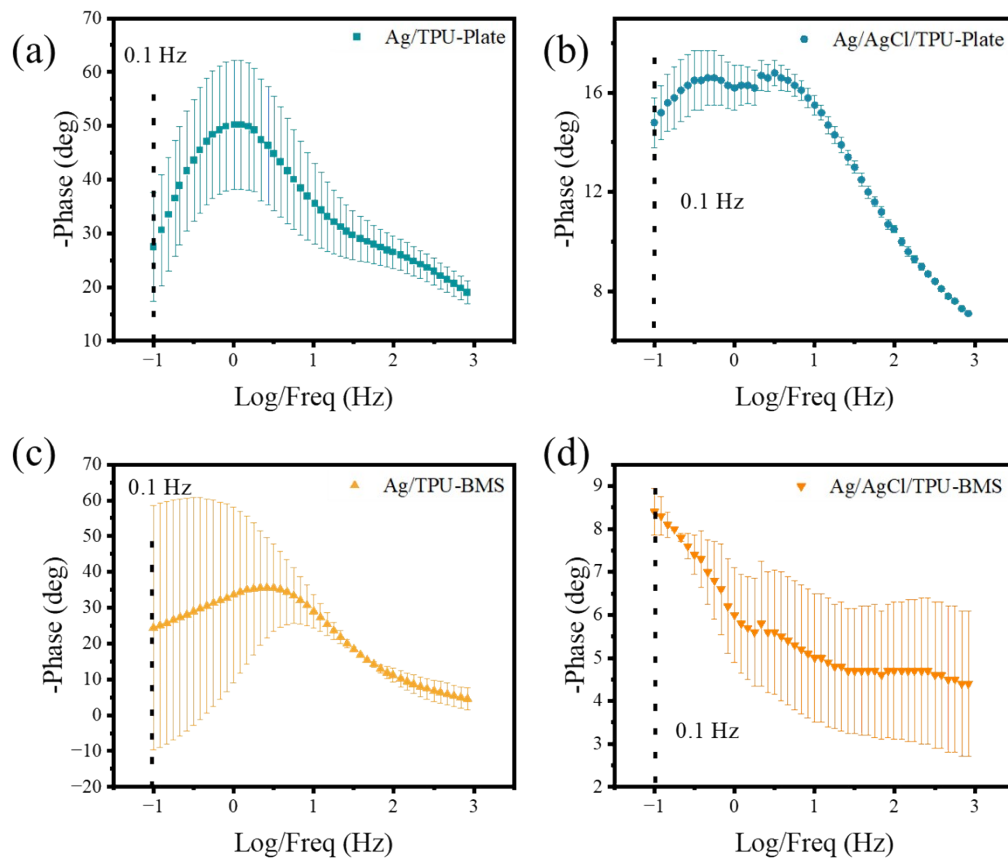


Figure S7 Electrode electrolyte interface: phase degree-frequency curve (a) Ag/TPU-plate, (b) Ag/AgCl/TPU-plate, (c) Ag/TPU-BMS, (d) Ag/AgCl/TPU-BMS

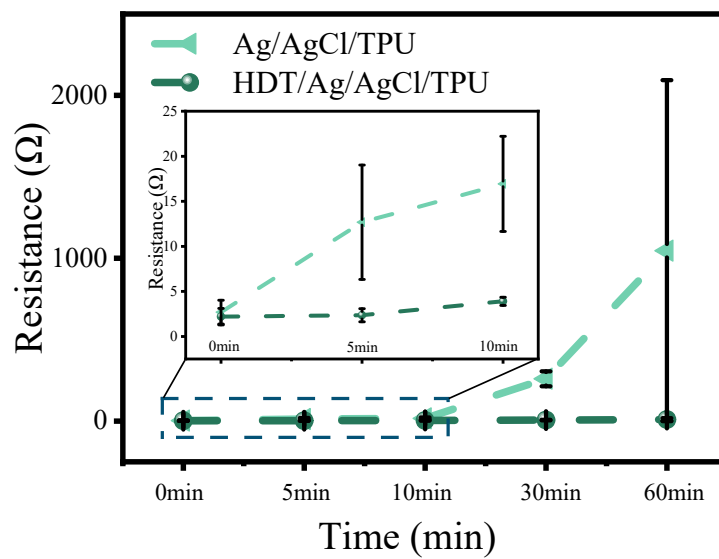


Figure S 8 Changes in resistance after Na_2S corrosion for 0-60min

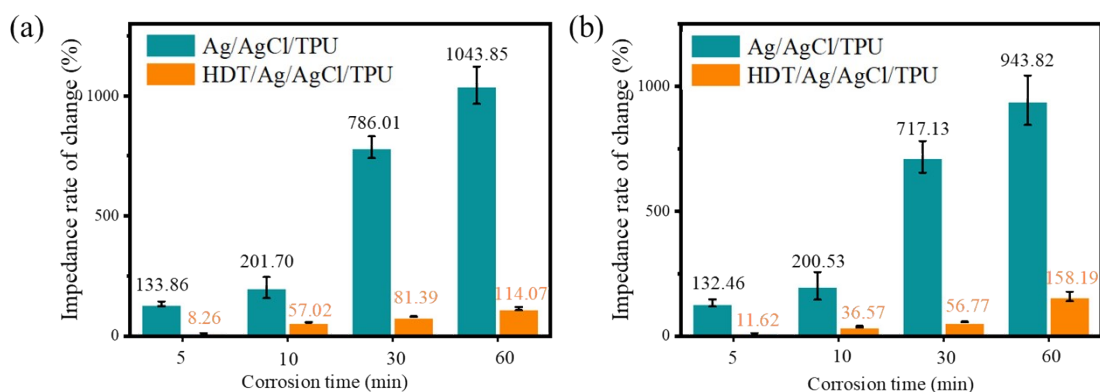


Figure S 9 Impedance rate of change of the electrodes before and after mercaptan treatment in Na_2S solution of (a) 0.1Hz, and (b) 10Hz

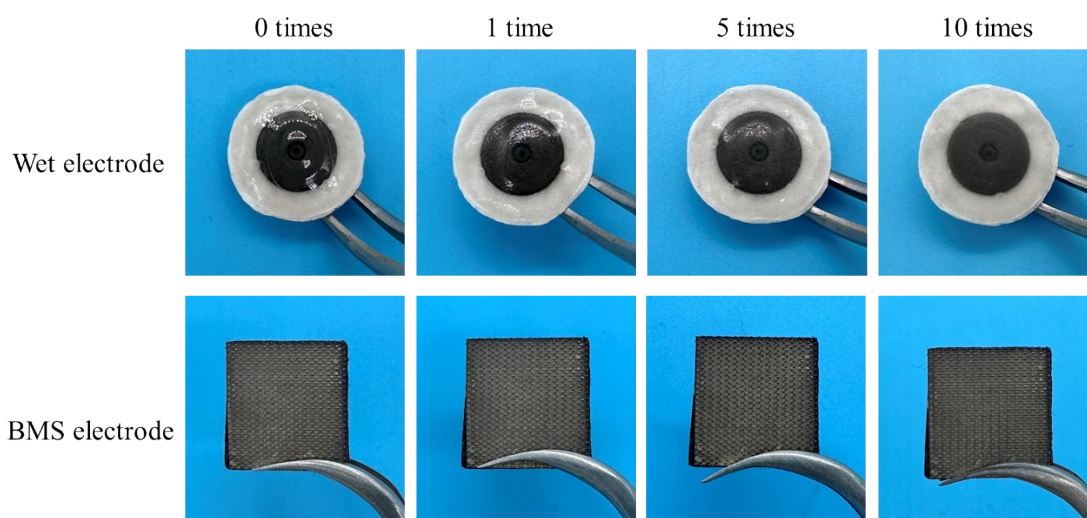


Figure S 10 Optical photographs of wet electrode and BMS electrode be adhered on human skin after 0 times, 1 time, 5times and 10 times

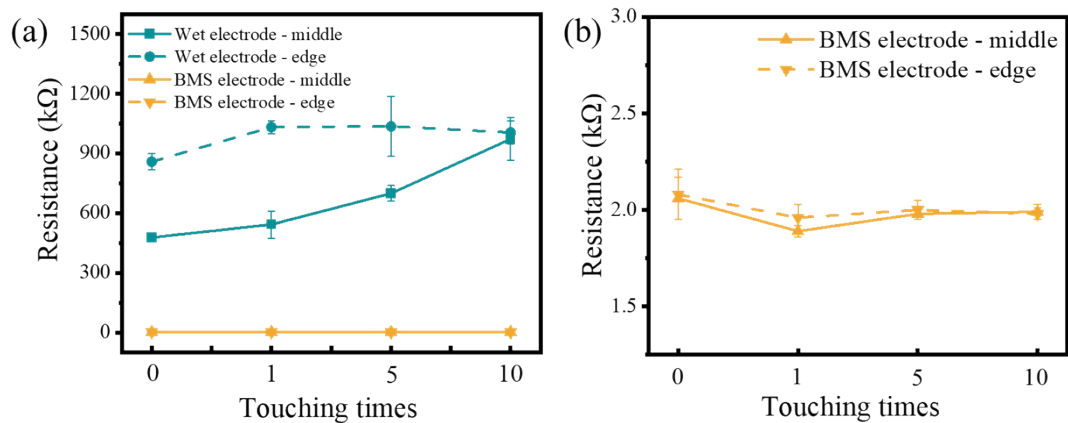


Figure S 11 Resistance of wet electrode and BMS electrode be adhered on human skin after 0 times, 1 time, 5times and 10 times

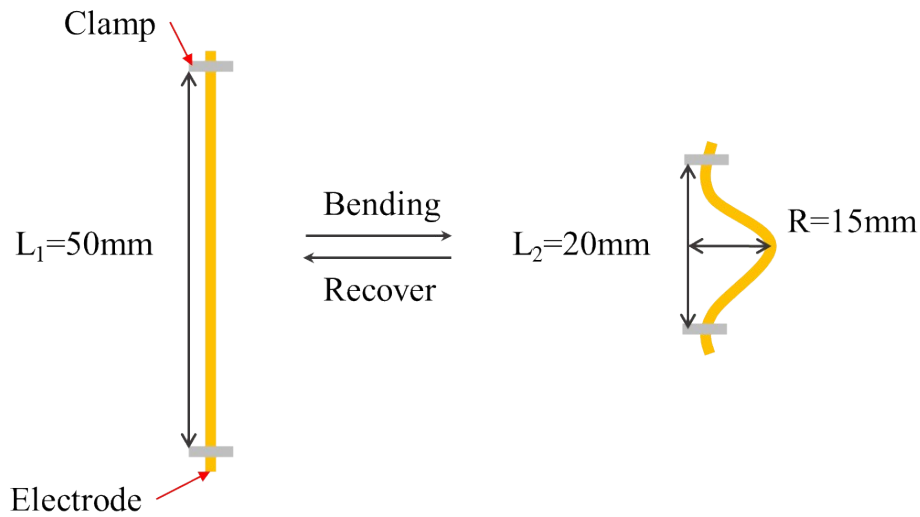


Figure S 12 Schematic diagram of bending test

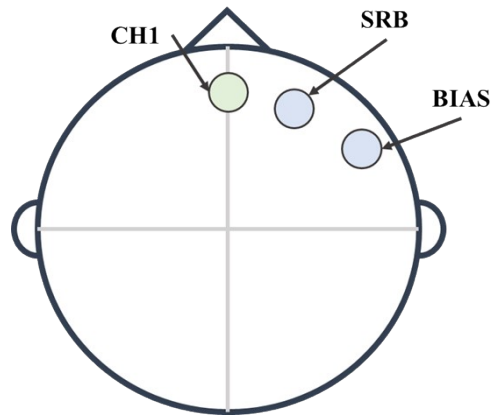


Figure S 13 Schematic diagram of electrodes position for on-body EEG testing



Figure S 14 Photographs of eyes condition for on-body EEG testing (a) calm opening and (b) calm close. Blinking occurs when (a) and (b) repeats.

Table S 1 sample information

Samples	Explanation
TPU	The barb microstructure TPU membrane before silver plating
Ag/TPU	The barb microstructure TPU membrane after silver plating
Ag/TPU-plate	A plate TPU membrane with silver plating
Ag/TPU-BMS	A barb microstructure TPU membrane with silver plating
Ag/AgCl/TPU	A silvered TPU membrane after chlorination
HDT/Ag/AgCl/TPU	The final electrode, which has a barb microsture TPU

Ag/AgCl/TPU-plate (Plate)	membrane, a Ag/AgCl plating, and after mercaptan treatment
Ag/AgCl/TPU-BMS (BMS)	A plate TPU membrane with Ag/AgCl plating
Wet	A barb microstructure TPU membrane with Ag/AgCl plating
	The wet electrode
