Electronic Supplementary Information

A Self-Powered Brain-Linked Biosensing Electronic-Skin for Actively Tasting Beverage and Its Potential Application in Artificial Gustation

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Fig. S1 The SEM images of the gap between Ppy and PDMS.
Fig. S2 The high magnification SEM image of PDMS.
Fig. S3 The chemical structural formulas of Ppy upon exposure to H⁺ and OH⁻ ions.
Fig. S4 The outputting triboelectric current under different temperature.
Fig. S5 The outputting triboelectric current against different ions in the solution: (a) NaCl and (b) K$_2$SO$_4$. 
Fig. S6 The sensing performance of pH sensing units against hydrochloric acid, acetic acid, NH$_3$ and KOH solutions. (a, b) The outputting triboelectric current of pH sensing unit (pH<7) against different pH value (hydrochloric acid and acetic acid solutions). (c, d) The outputting triboelectric current of pH sensing unit (pH>7) against different pH value (NH$_3$ and KOH solutions).
Fig. S7 (a) The outputting triboelectric current of pH sensing unit (pH<7) against different pH value (7, 5, 4, 3, 2 and 1) hydrochloric acid solutions. (b) The outputting triboelectric current of pH sensing unit (pH>7) against different pH value (7, 8, 9, 10, 11, 12, 13 and 14) NaOH solutions.
Fig. S8 The response of alcohol sensing unit stored in -20 °C during 1-5 days. The response recover after replenishing alcohol oxidase.
Fig. S9 The flexibility of the e-skin. (a) The outputting triboelectric current of pH sensing unit under 15°, 30°, 45° and 60° bending angles. (b) The outputting current of pH sensing unit (pH<7) against pure water (pH=7) and hydrochloric acid solution (pH=3). (c) The outputting current of pH sensing unit (pH>7) against pure water (pH=7) and NH3 solution (pH=10). (d) The response between outputting current of pH sensing unit (pH<7) and bending angles. (e) The response between outputting current of pH sensing unit (pH>7) and bending angles.
**Video S1** Five devices (10 × 5 cm) are connected in parallel to provide the stimulation signals. When the devices are swiftly slapped by hand, there is a shaking activity of mouse body and an obvious leg extension.