Appendix B

Screen-printing of carbon and silver-silver chloride paste on PVC sheet

The carbon and silver-silver chloride electrodes are separately produced on a PVC sticker sheet using manual screen-printing technique, as shown in Fig. S2. The design and dimensions of the printed electrodes are given in Fig. S3. A PVC sticker sheet (105 mm x 148 mm) was died cut using a Silhouette America® programmable die cutting machine (Step 1) to obtain 16 identical rectangular sections (15 mm x 30 mm). In each section, there are also one circular hole and one rectangular hole at the top and bottom (see expanded diagram Step 1 of Fig. S2). The die-cut PVC sheet is then fixed onto the screen-printing frame. Approximately 0.1 g of carbon paste ink is poured onto one end of the screen mesh with the required pattern of the 16 electrodes. A squeegee with a rubber blade is dragged across the mesh to fill all mesh opening. The screen is released and the printed PVC sheet removed to hang dry at ambient temperature in a good ventilation environment for about 30 min. The same PVC sheet is then printed with silver-silver chloride ink using the same screen-printing process but with a mesh with the design for the 16 reference electrodes (Step 3 of Fig. S2). The printed sheet is again hung to dry at the ambient temperature for another 30 min. Each individual screen-printed section is then carefully peeled off for further assembling steps, as depicted in Fig. 1a.

Note: (1) All screen-printing tools were obtained and ordered from a local screen-printing store in Bangkok that provide T-shirt screen-printing services. The store produced the meshes according to our customized patterns (mesh 1 and mesh 2) for separate printing of carbon and silver-silver chloride inks, respectively.

(2) The design of the printed carbon and silver-silver chloride electrodes is the same as previously

reported designs [30].

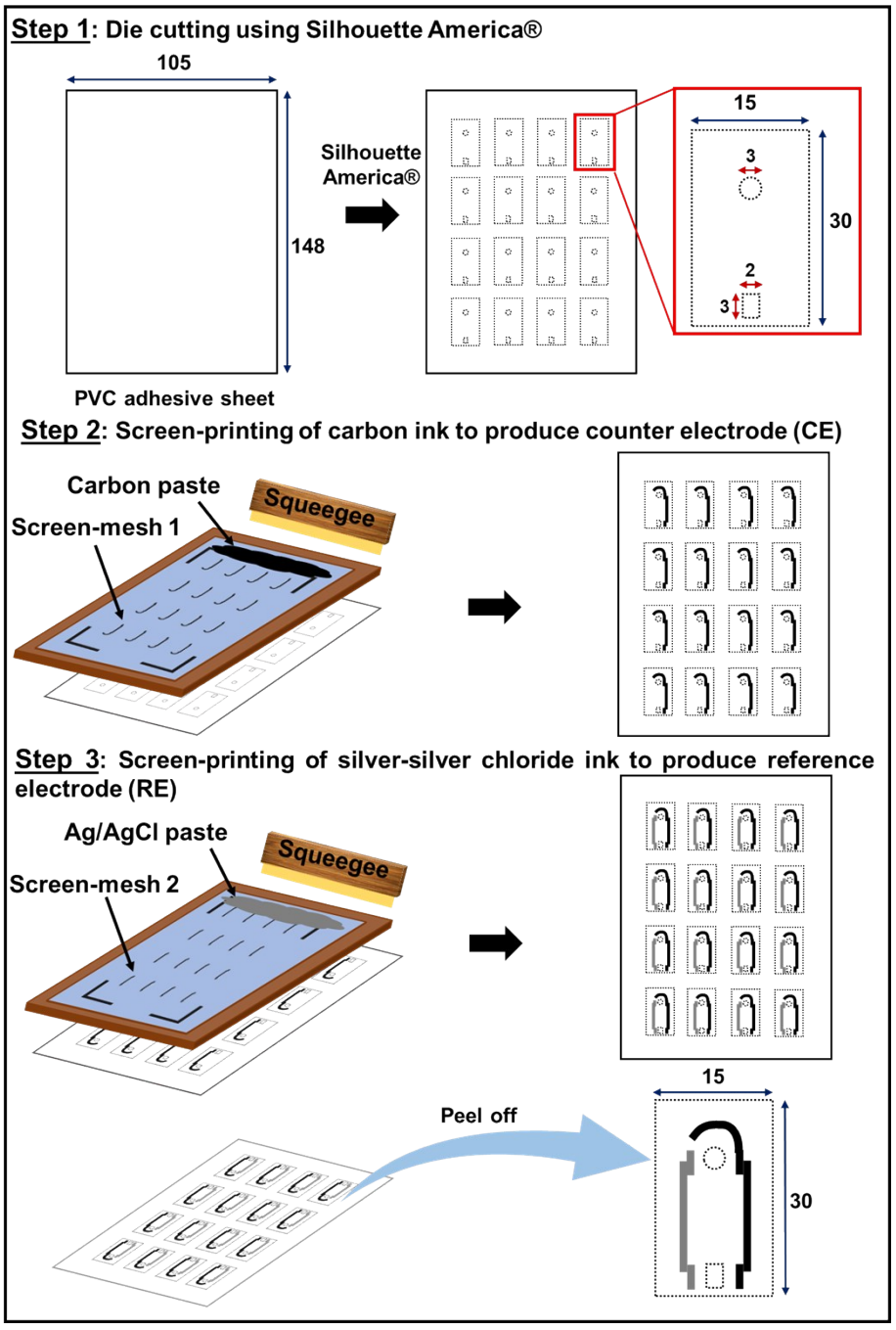

Fig. S2. Schematic diagram showing the fabrication of screen-printed electrodes on PVC sticker sheet. Note: dimensions are in millimeter.

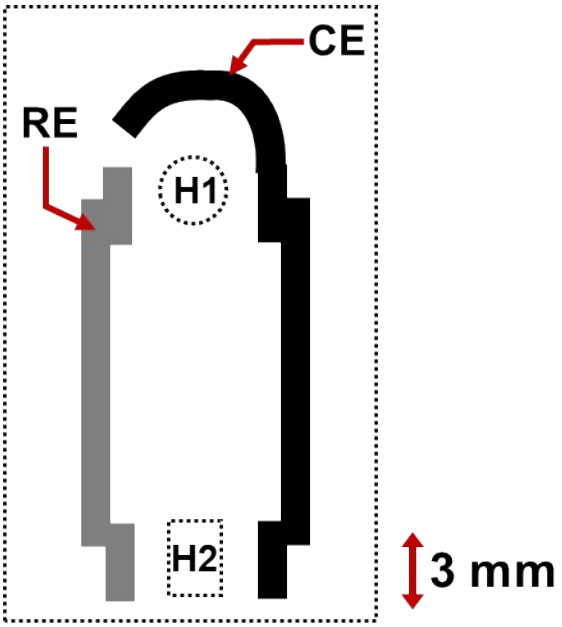

Fig. S3. Schematic diagram showing the patterns of printed-carbon counter electrode (CE), silver-silver chloride reference electrode (RE), 3 mm diameter circular hole (H1) and 2 mm × 3 mm rectangular hole (H2) of electrical contact pad.