Supporting Information for

Alleviating concentration polarization: A micro three-electrode interdigitated glucose sensor based on nanoporous gold from a mild process

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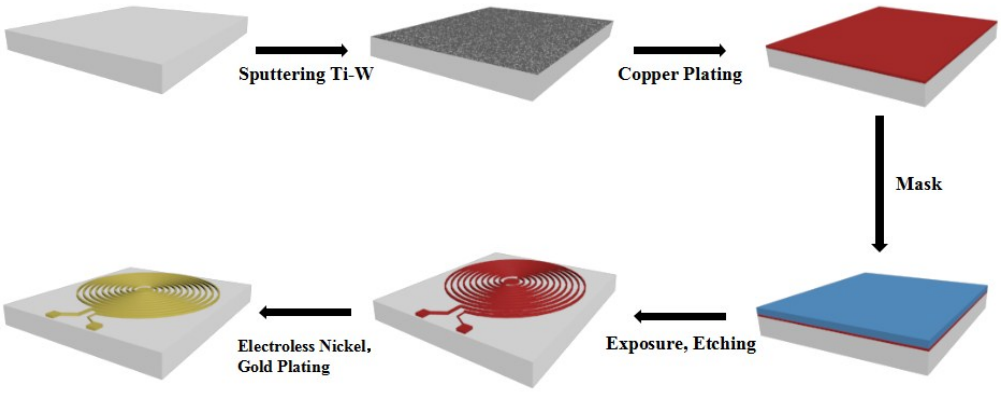

Fig. S1 The fabrication process of interdigitated electrode on ceramic circuit board

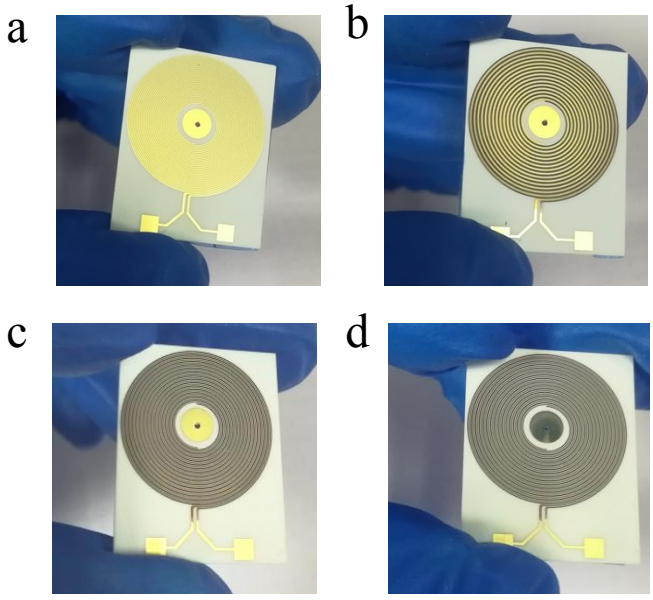

Fig. S2 Photographs of the samples in different fabrication process. (a) The three- electrodes interdigitated device without any process; The sample electrodeposited with (b) Pt, (c) NPG, and (d) Ag-AgCl.

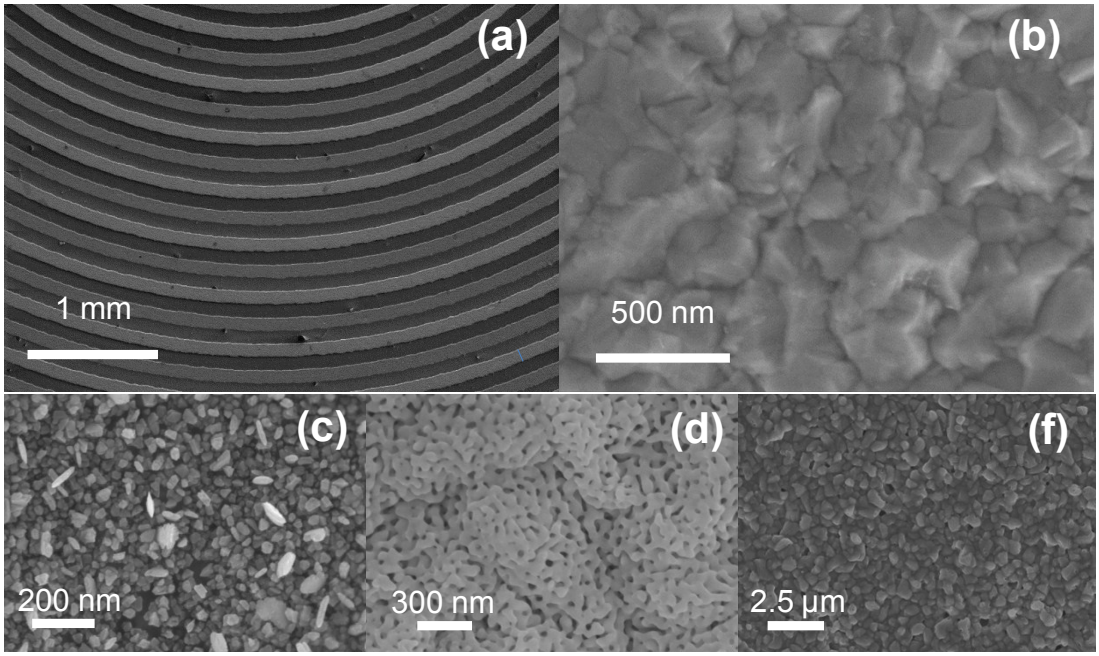

Fig. S3 SEM images of the (a) interdigitated electrodes, the (b) planar Au substrate (c) Pt counter electrode, (d) NPG working electrode and (f) Ag/AgCl reference electrode.

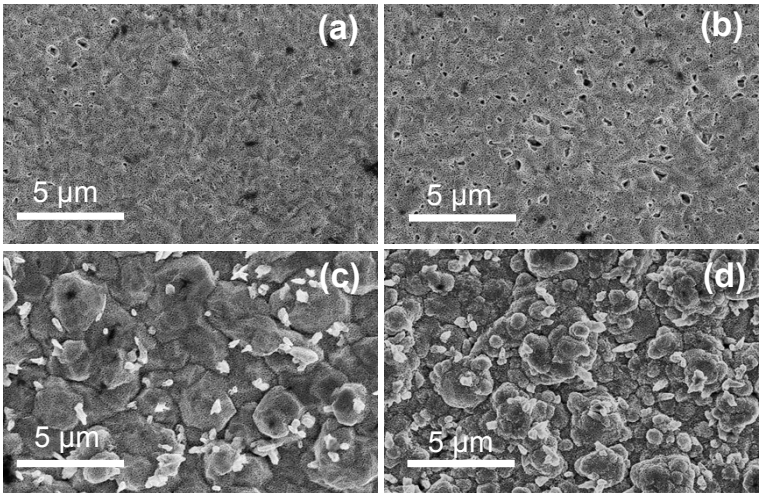

Fig. S4 SEM images of NPG prepared in different current density: (a) 0.5, (b) 0.8, (c) 1.1 and (d) 1.4 A dm^{-2}.

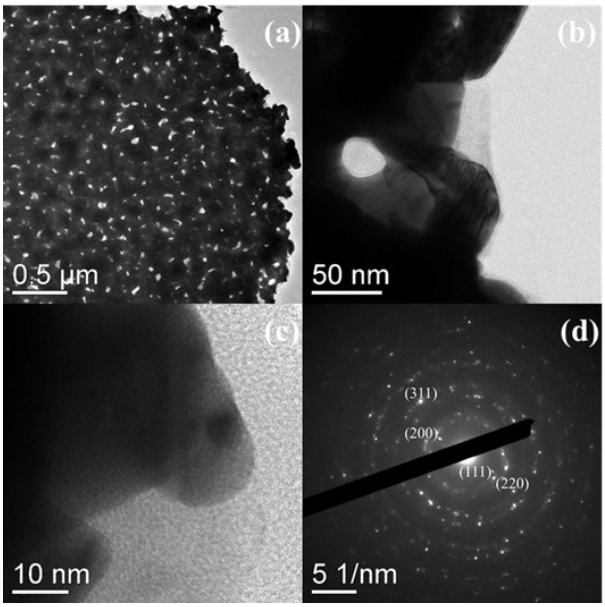

Fig. S5 (a-c) TEM images of NPG with different magnifications. (d) SAED pattern of NPG.

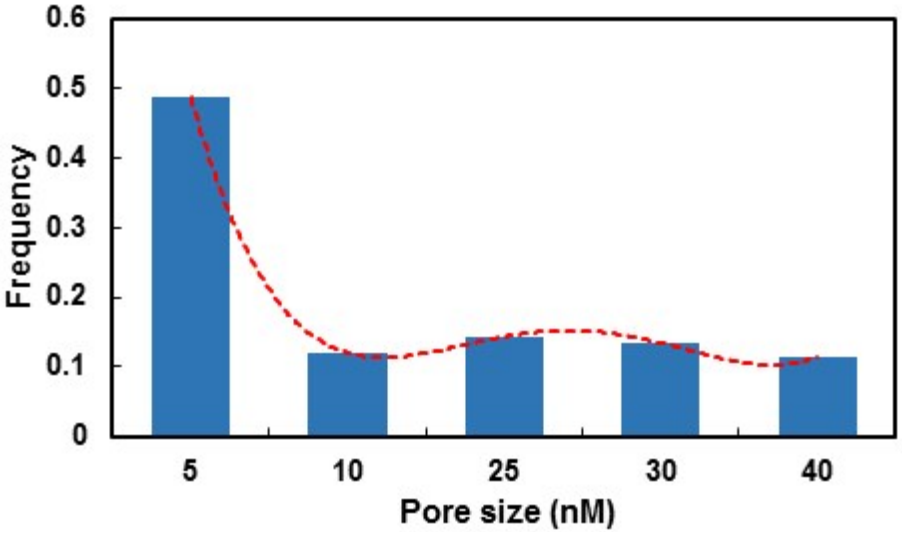

Fig. S6 Pore size distributions of NPG.

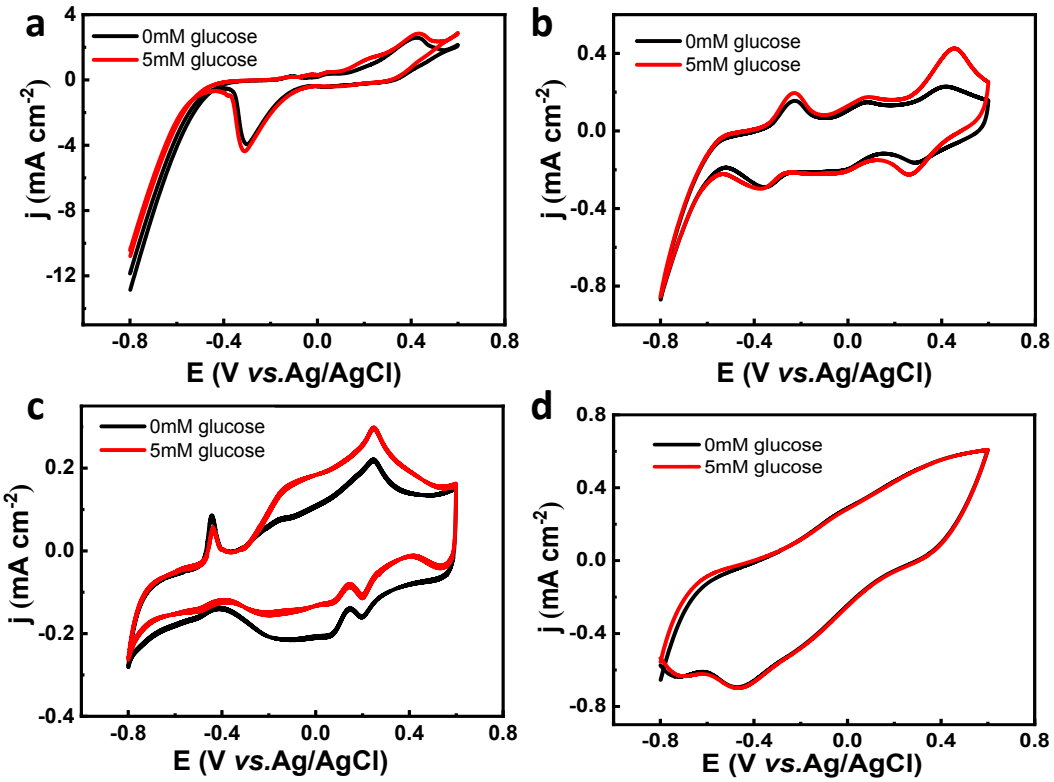

Fig. S7 CV curves of NPG electrode in (a) 0.1M HCl (pH=1.00), (b) potassium hydrogen phthalate (pH=4.00), (c) PBS (pH=7.00) and (d) sodium tetraborate (pH=9.18) with and without 5mM glucose at a scan rate of 20mV s^{-1}

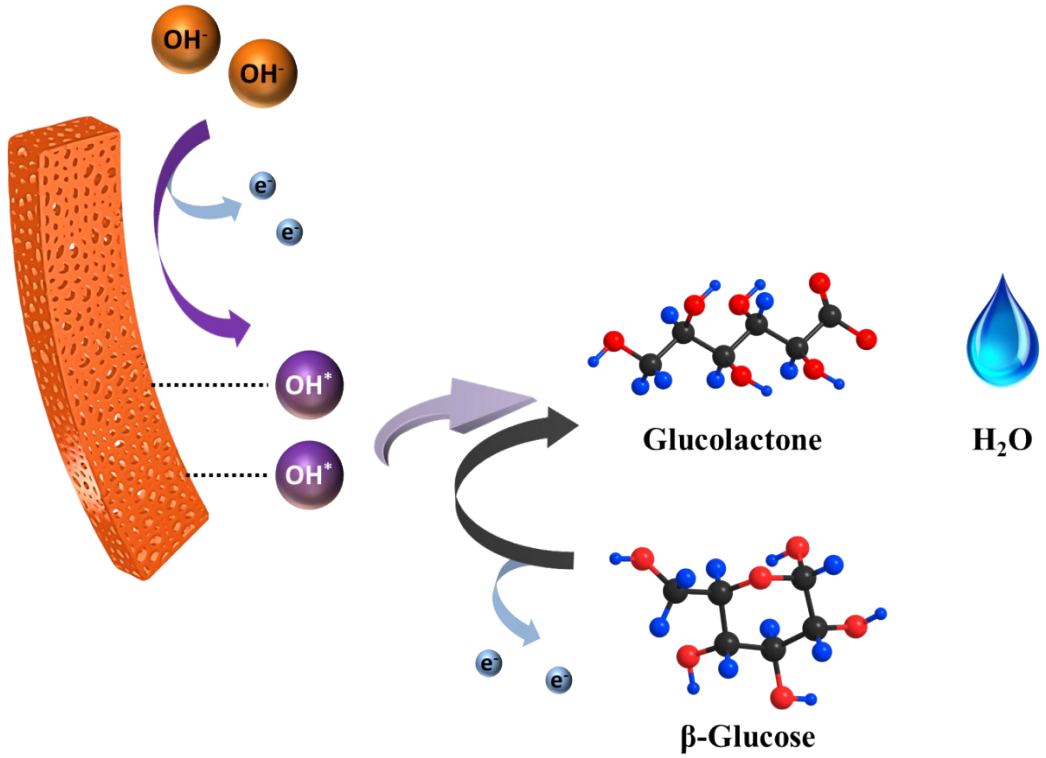

Fig. S8 Mechanism of the NPG detecting glucose in alkaline environment

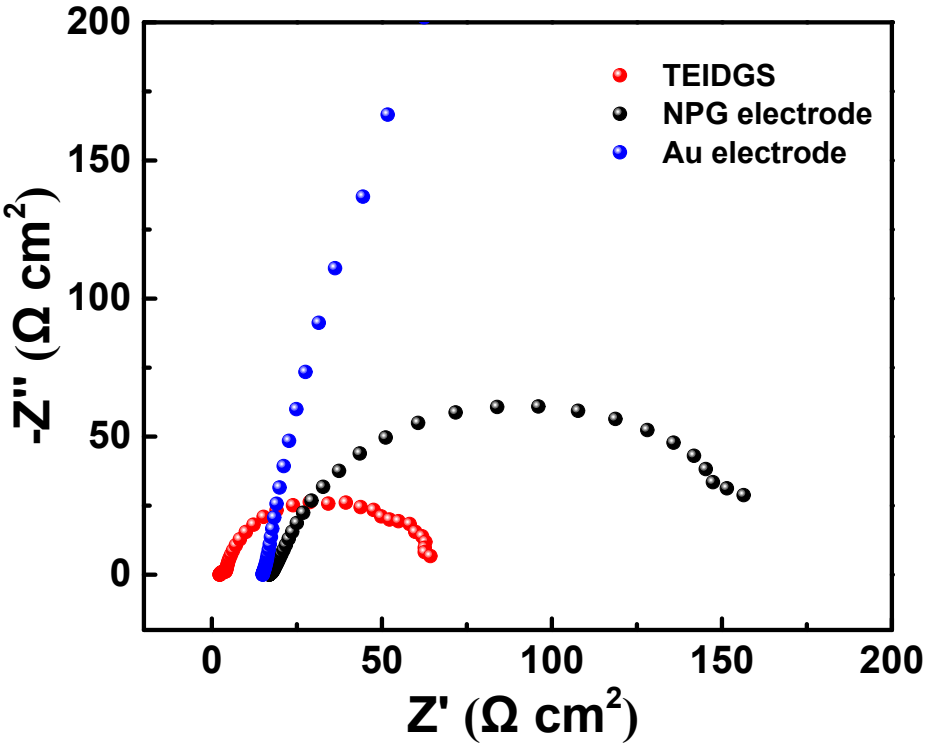

Fig. S9 The EIS comparison of the TEIDGS, NPG electrode and planar Au electrode in 0.1 M KOH and 0.01 M KCl solution containing 5 mM glucose at a frequency ranging from 0.01 Hz to 100 kHz with a potential amplitude of 10 mV under a DC bias of 0.1 V.

Table S1. Fitting values of different equivalent circuit elements by Z-view for TEIDGS and NPG electrode (values in parentheses are fitting errors).

	R_s （Ω）	R_{ct} （Ω）	R_p （Ω）	C（mF）	CPE-T (mF)	CPE-P
NPG	16.93（0.144 4%）	30.78 （1.060%）	100.6 （3.812%）	5.200 (1.161%)	22.02 (3.659%)	0.5493 (1.441%)
TEIDGS	2.362 (0.6517%)	1.52 (2.632%)	62.00 (1.101%)	0.2204 (4.213%)	3.192 (1.852%)	0.9018 (0.5967%)