

SUPPORTING INFORMATION

Synthesis and characterization of carboxylated polybenzimidazole and its use as a highly sensitive and selective enzyme-free H₂O₂ sensor

Mu-Yi Hua,^{*a,b} Hsiao-Chien Chen,^{a,b} Rung-Ywan Tsai,^c Yann-Lii Leu,^d Yin-Chih Liu^{a,b} and Jinn-Tsy Lai^e

^a Green Technology Research Center, *Department of Chemical and Materials Engineering, Chang Gung University, Tao-Yuan 33302, Taiwan, R.O.C. Tel: +886-3-2118800; Fax: +886-3-2118668; E-mail: huamy@mail.cgu.edu.tw*

^b Biosensor Group, Biomedical Engineering Research Center, *Chang Gung University, Tao-Yuan 33302, Taiwan, R.O.C.*

^c *Electronics and Optoelectronics Research Laboratories, Industrial Technology Research Institute, Hsinchu 31040, Taiwan, R.O.C.*

^d *Natural Products Laboratory, Graduate Institute of Natural Products, Chang Gung University, Tao-Yuan 33302, Taiwan, R.O.C.*

^e *Food Industry Research and Development Institute, Hsinchu 30062, Taiwan, R.O.C.*

Table S-1 Relative percentages of N(1s) peak areas for PBI, PBI-BA and PBI-BA *N*-oxide

	Imine	Amine	N-substituted amine	Protonated imine	Oxidized imine
PBI	49%	51%	–	–	–
PBI-BA	44%	29.5%	20.5 %	6%	–
PBI-BA <i>N</i> -oxide	35%	29.5%	20.5 %	6%	9%

–: Data not available.

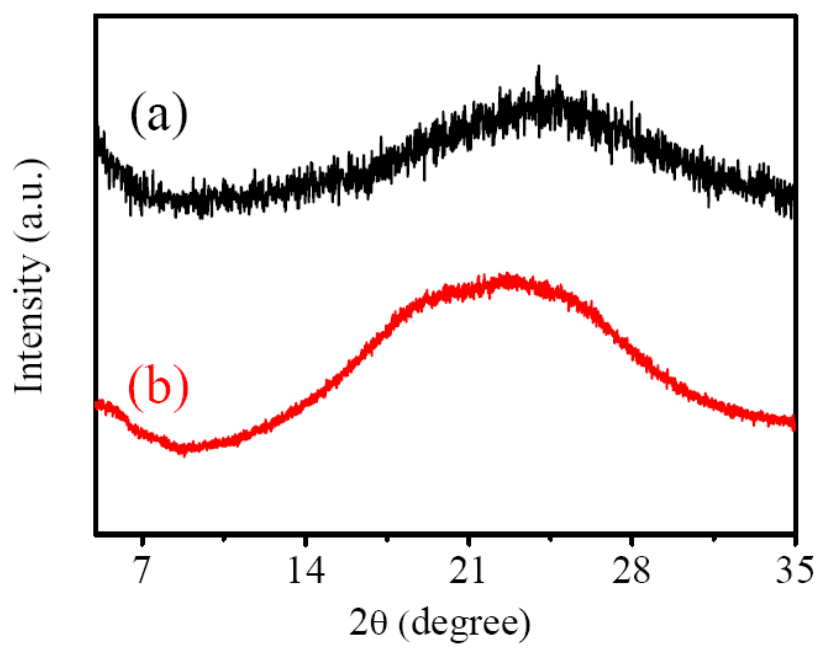


Fig. S-1 WAXS patterns of (a) PBI and (b) PBI-BA from 5–35° at a scan rate of 1 °/min.

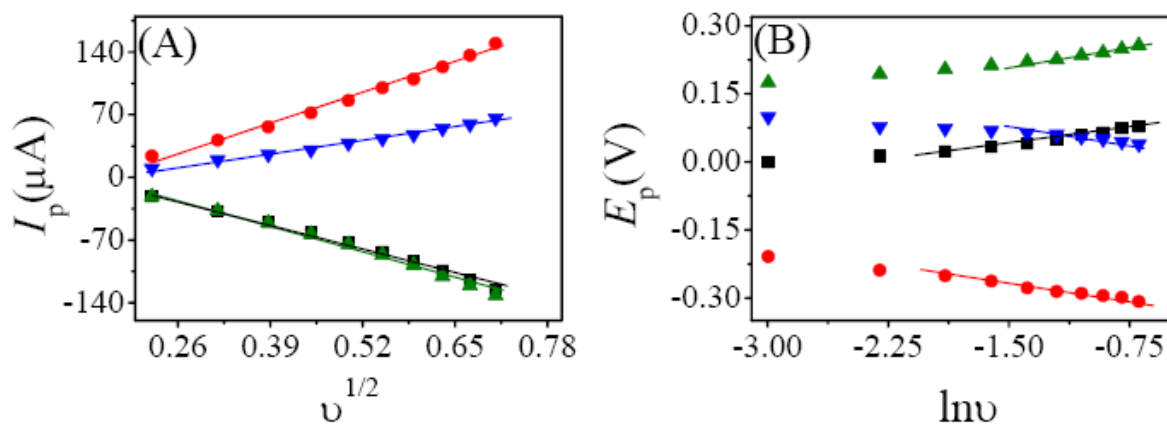


Fig. S-2 Linear relationships of (A) peak current vs. the square root of v and (B) peak potential vs. the natural logarithm of v for a PBI-BA/Au electrode at pH 7.0. (■: 1st oxidation peak; ●: 1st reduction peak; ▲: 2nd oxidation peak; ▼: 2nd reduction peak)

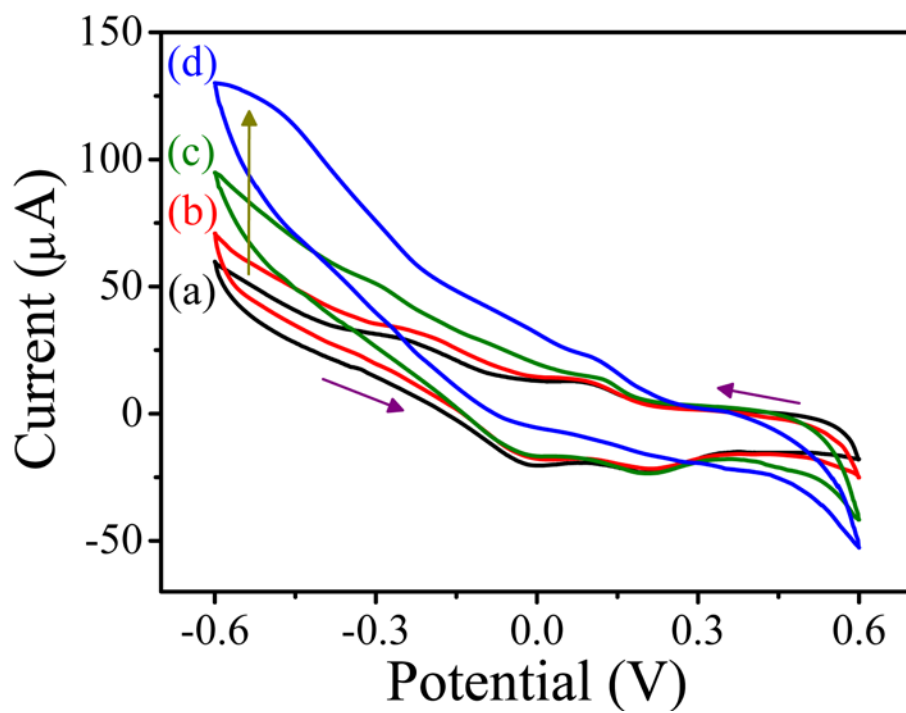


Fig. S-3 CVs of a PBI-BA/Au electrode in the presence of (a) 0, (b) 1, (c) 3, and (d) 10 mM H₂O₂.

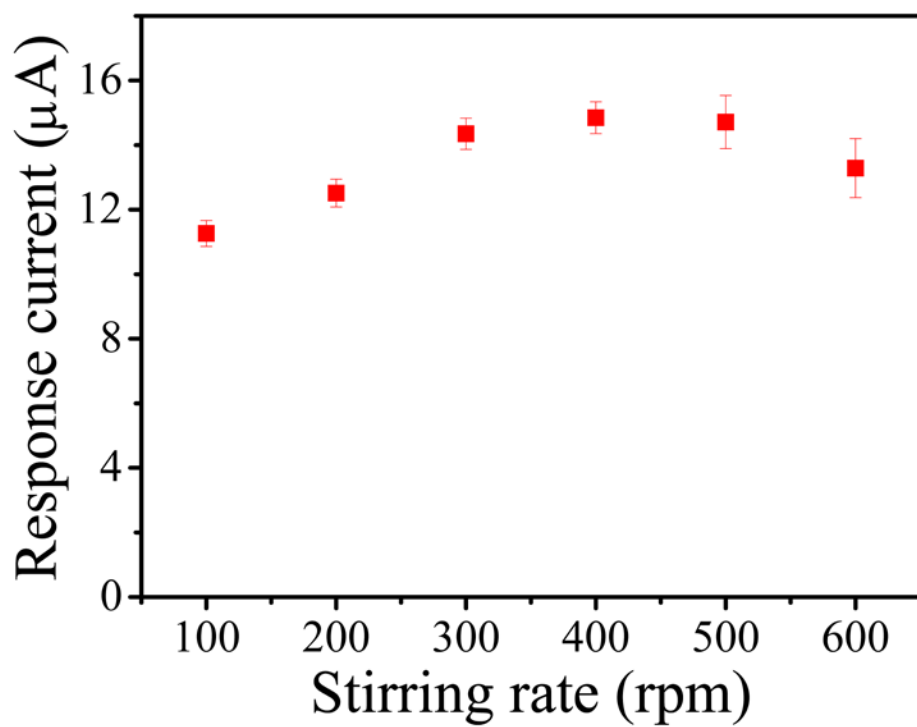


Fig. S-4 Current response of a PBI-BA/Au electrode at an applied potential of -0.5 V using various stirring rates.

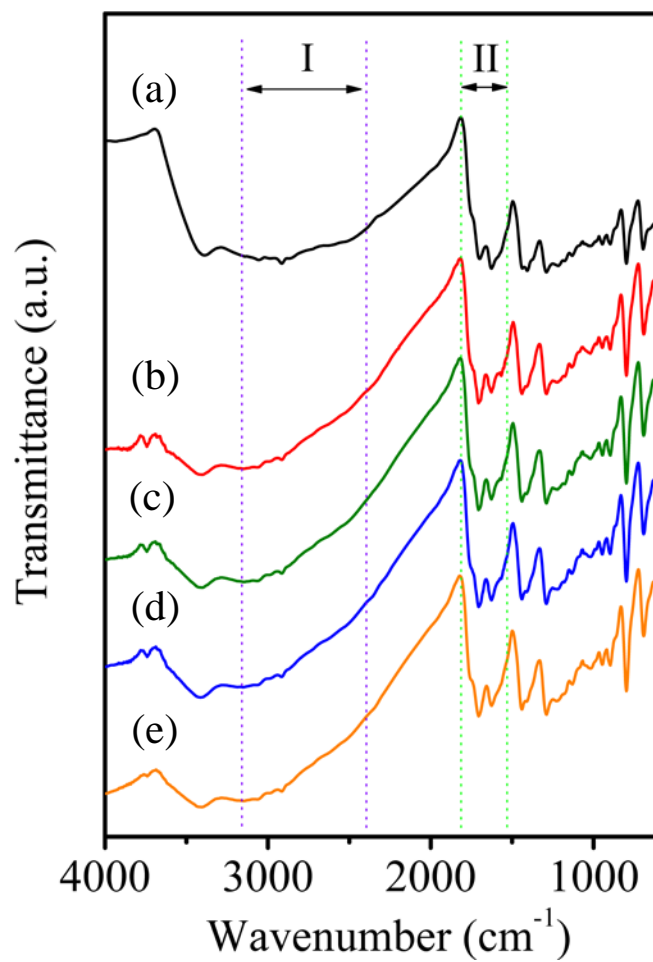


Fig. S-5 The FT-IR spectra of PBI-BA treated thermally at 100 °C for (a) 0, (b) 1, (c) 5, (d) 7 and (e) 10 days.

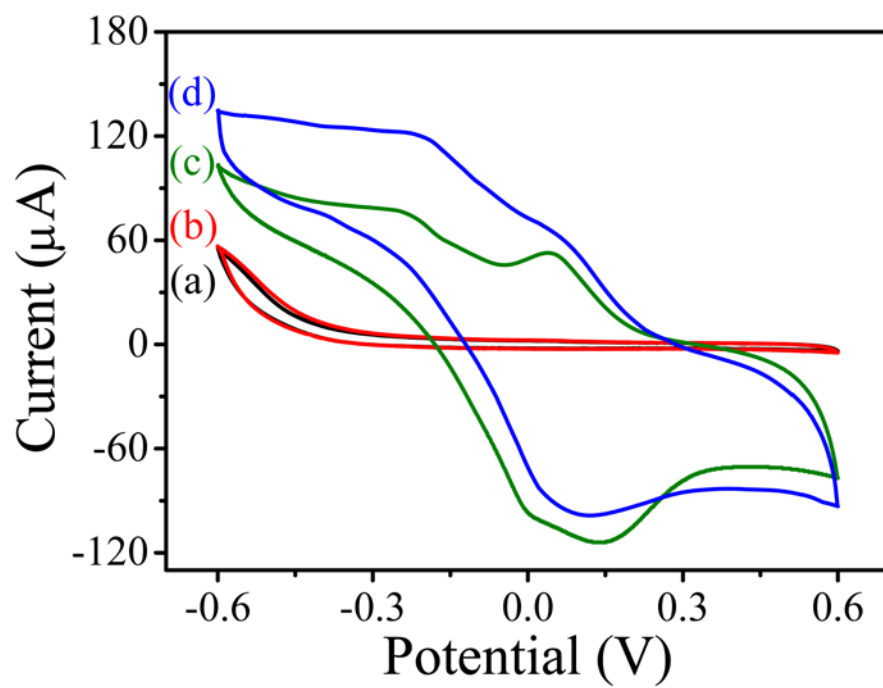


Fig. S-6 The CVs of Gs/Au (a and b) and PBI-BA-Gs/Au (c and d) electrodes in the absence (a and c) and presence (b and d) of 1 mM H_2O_2 .