

(Supplementary information)

Reduced graphene oxide-polyaniline film as enhanced sensing interface for the detection of loop-mediated-isothermal-amplification products by open circuit potential measurement

Vu Thi Thu^{a,b}, Bui Quang Tien^{c,d}, Dau Thi Ngoc Nga^{a,b}, Ly Cong Thanh^{c,e}, Le Hoang Sinh^f, Tu Cam Le^g, Tran Dai Lam^{b,c,*}

^aUniversity of Science and Technology of Hanoi (USTH), Vietnam Academy of Science and Technology (VAST), 18 Hoang Quoc Viet, Cau Giay, Hanoi, Vietnam

^bCenter for High Technology Development (HTD), Vietnam Academy of Science and Technology (VAST), 18 Hoang Quoc Viet, Cau Giay, Hanoi, Vietnam

^cGraduate University of Science and Technology (GUST), Vietnam Academy of Science and Technology (VAST), 18 Hoang Quoc Viet, Cau Giay, Hanoi, Vietnam

^dMilitary Academy of Logistics, Ngoc Thuy, Long Bien, Hanoi, Vietnam

^eHanoi University of Pharmacy, 15-17 Le Thanh Tong, Hoan Kiem, Hanoi, Vietnam

^fDuy Tan University, 254 Nguyen Van Linh, Thanh Khe, Da Nang, Vietnam

^gSchool of Engineering, RMIT University, GPO Box 2476, Melbourne, VIC 3001, Australia

- Corresponding authors: trandailam@gmail.com

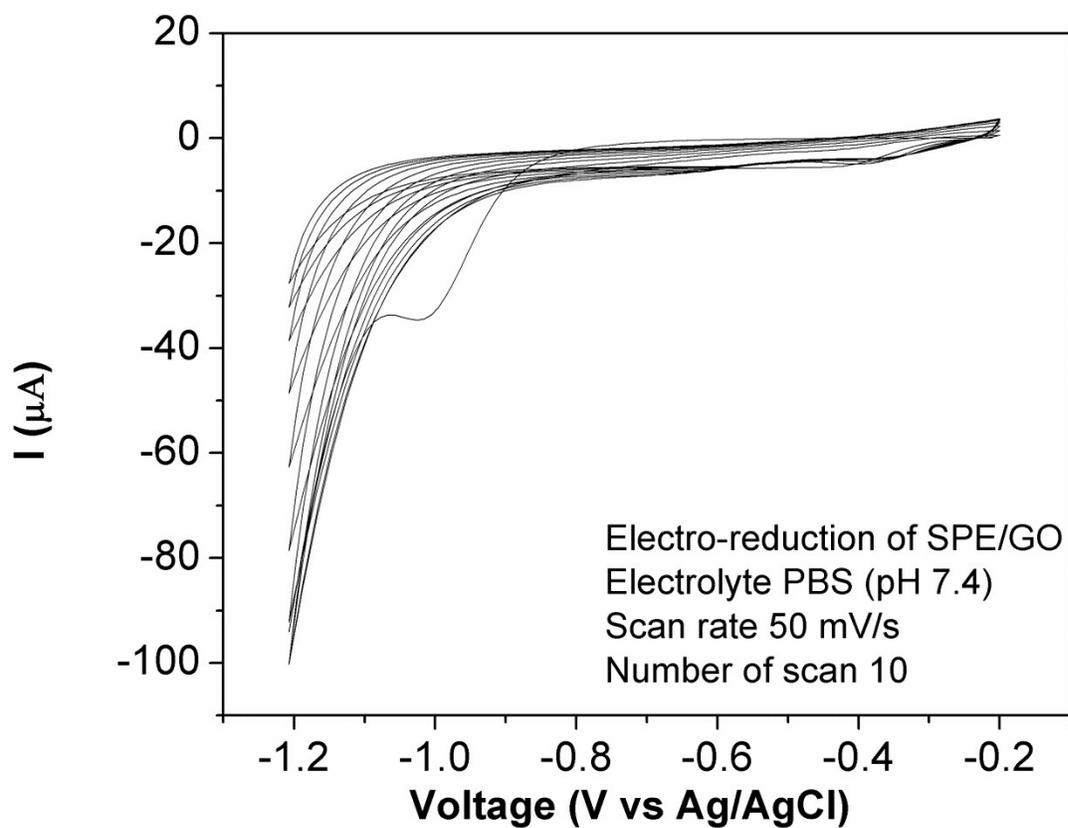


Fig 1S. Electro-reduction of graphene oxide coated SPE: The graphene oxide film was electrochemically reduced by sweeping in PBS solution (pH 7.4) at scan rate of 50 mV/s for several scans.

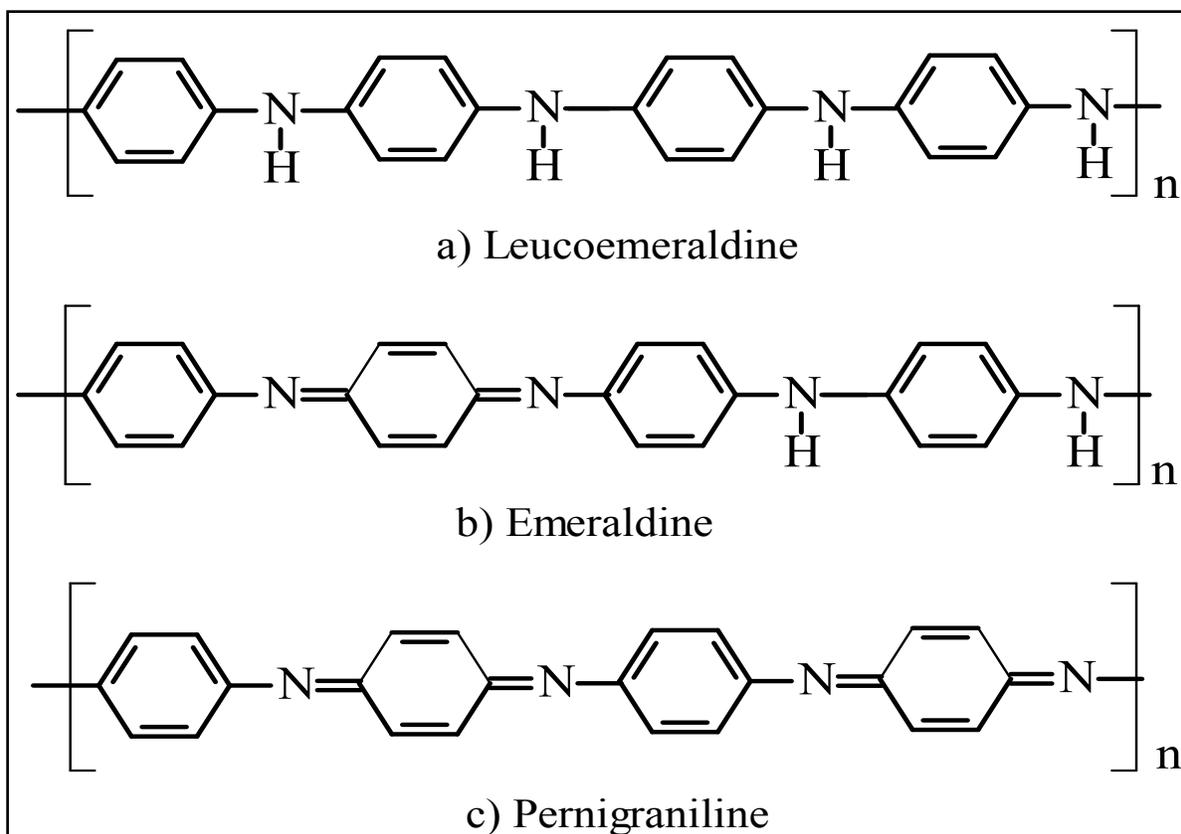


Fig 2S. The available states of polyaniline: Leucoemeraldine (transparent, poorly conductive), Emeraldine (green, conductive), and Pernigraniline (dark blue, poorly conductive). The emeraldine base can be transformed reversibly into emeraldine salt (H^+ doping or protonation process).

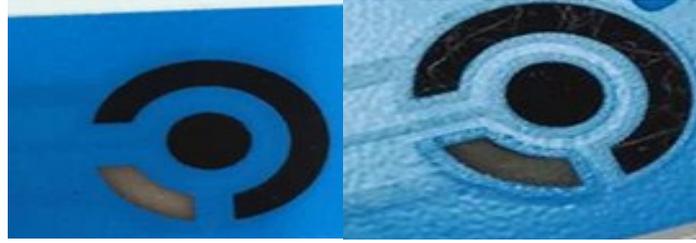


Fig 3S. Photos of screen printed electrodes before (left) and after (right) deposition of rGO/PANi film: The rGO/PANi film is porous and in dark color.

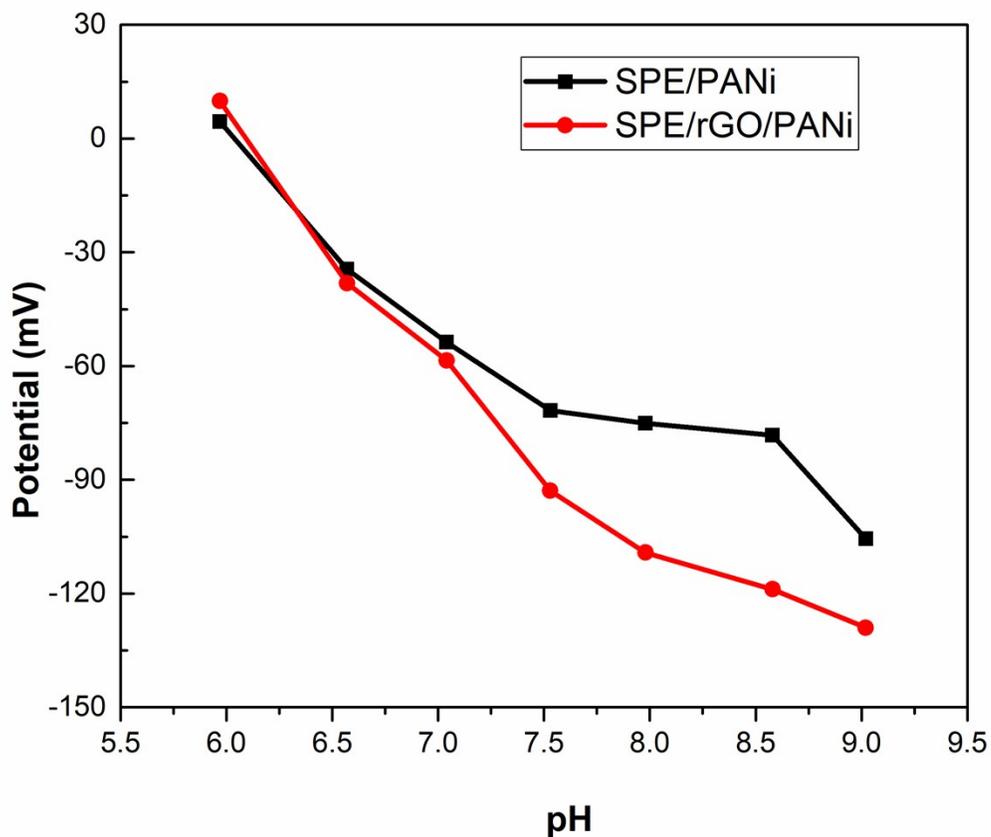


Fig 4S. pH calibration curve of SPE/PANi (black) and SPE/rGO-PANi (red) electrode: The equilibrium potential increases with decreasing pH due to the protonation of emeraldine base form of polyaniline. pH range 6.0 – 9.0 (buffered PBS solution). The presence of rGO film has promoted charge exchange at the interface.

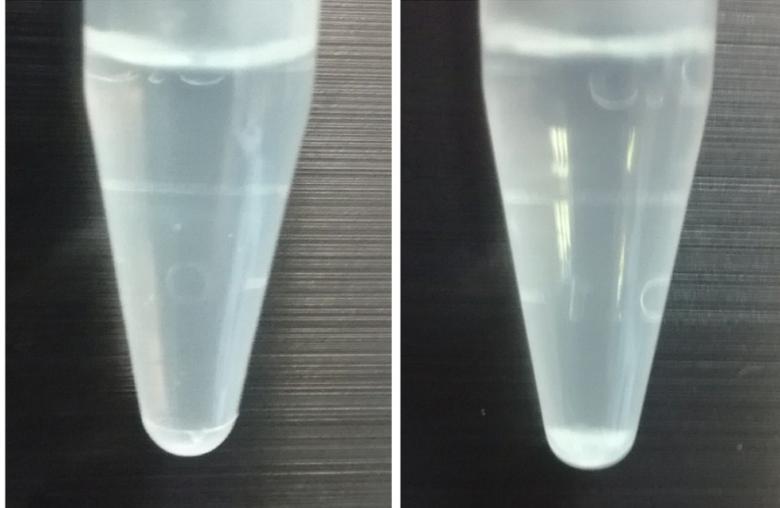


Fig 5S. Photos LAMP products for negative sample (left) and positive sample (right): The white precipitate for positive sample is an indicator for an effective gene amplification. The transparent solution was obtained for negative sample.