Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.


# Supporting Information

## Facile Potentiostatic Preparation of Functionalized Polyterthiophene Anchored Graphene Oxide as Metal-Free Electrocatalysts for Oxygen Reduction Reaction

M. Halappa Naveen,[a] Hui-Bog Noh,[a] Md Shahriar Al Hossain,[b] Jung Ho Kim,*[,b] and Yoon-Bo Shim*[,a]

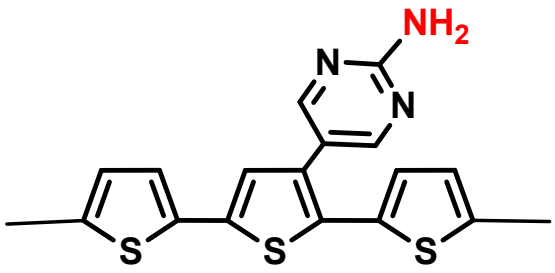
[a] Department of Chemistry, Pusan National University, Busan 609-735, Republic of Korea

[b] Institute for Superconducting and Electronic Materials, Australian Institute for Innovative Materials, University of Wollongong, North Wollongong, NSW 2500, Australia

[*] Corresponding authors: ybshim@pusan.ac.kr, jhk@uow.edu.au,

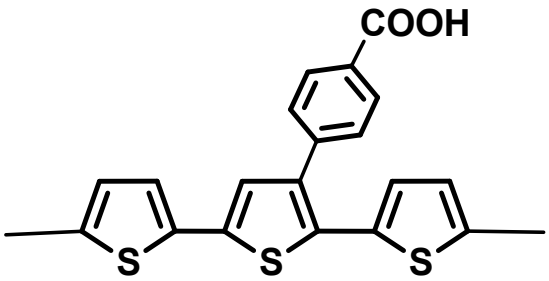
**Contents**

**Chemical structures of all the monomers**



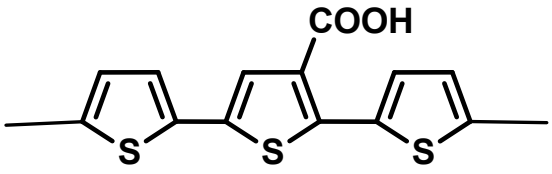

**APT**

3′-(2-aminopyrimidyl)-2,2′:5′,2″-terthiophene




**TBA**

3′-(*p*-benzoic acid)-2,2′:5′,2″-terthiophene




**TCA**

3′-(carboxylic acid)-2,2′:5′,2″-terthiophene

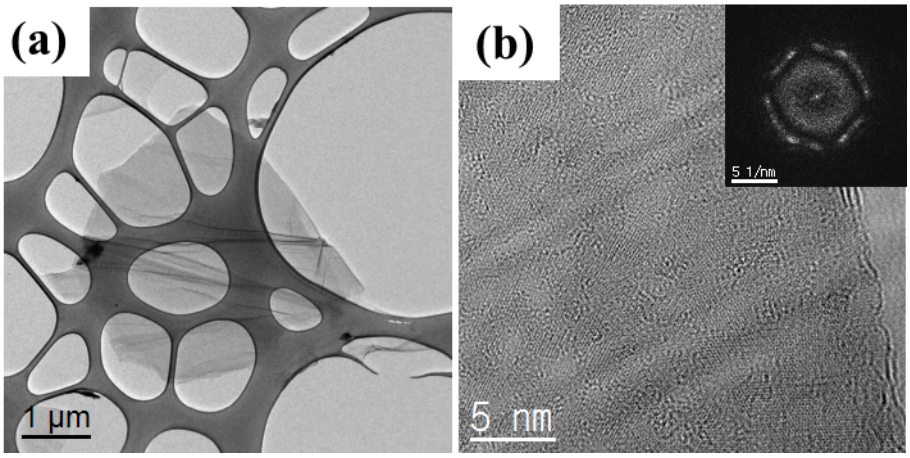



**Figure S1.** HR-TEM images of GO at (a) high magnification and (b) low magnification (inset: FFT pattern of the corresponding image).

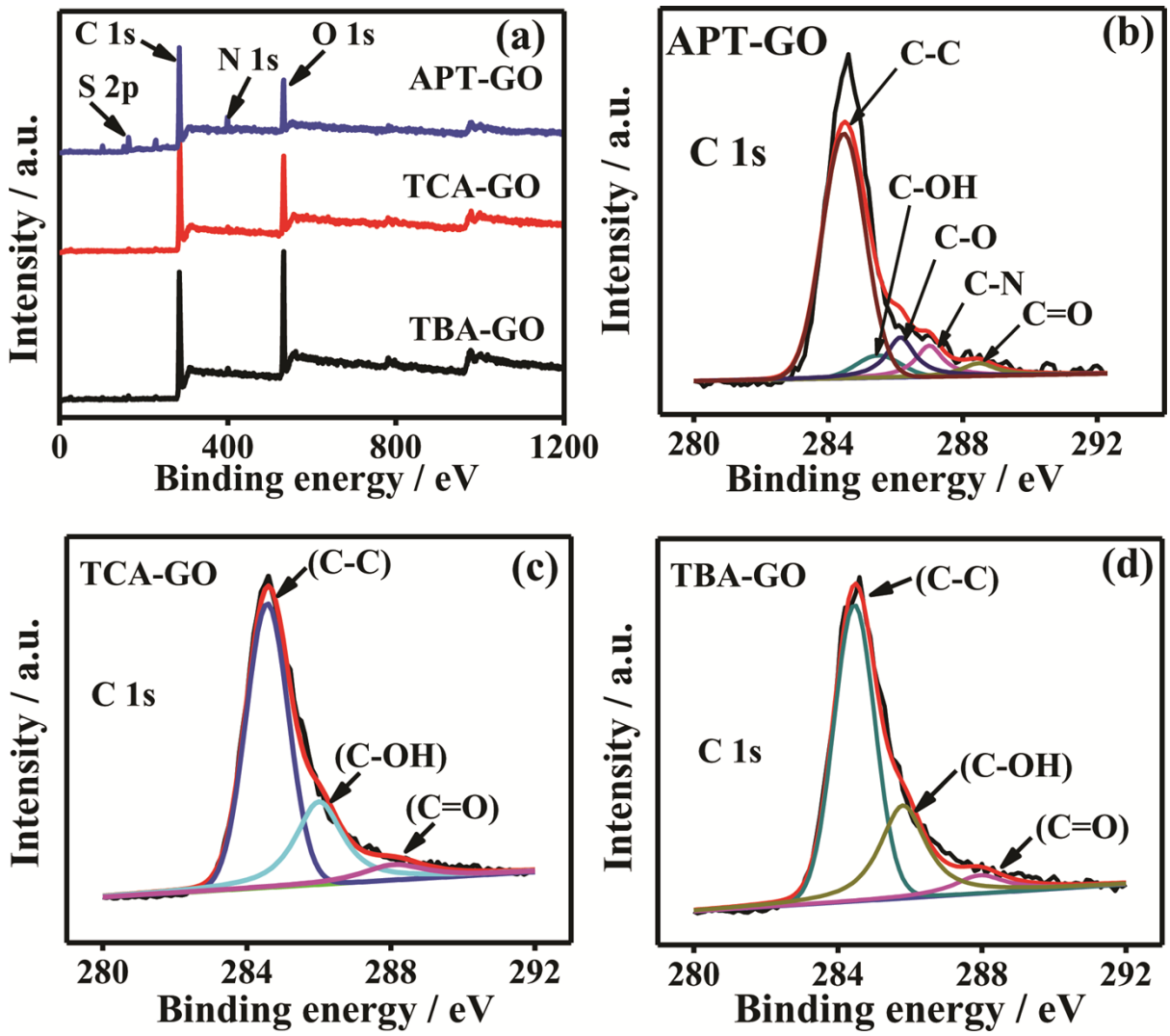



**Figure S2.** (a) XPS survey spectra of APT-GO, TCA-GO, and TBA-GO samples; high resolution C 1s spectra of (b) APT-GO, (c) TCA-GO, and (d) TBA-GO.

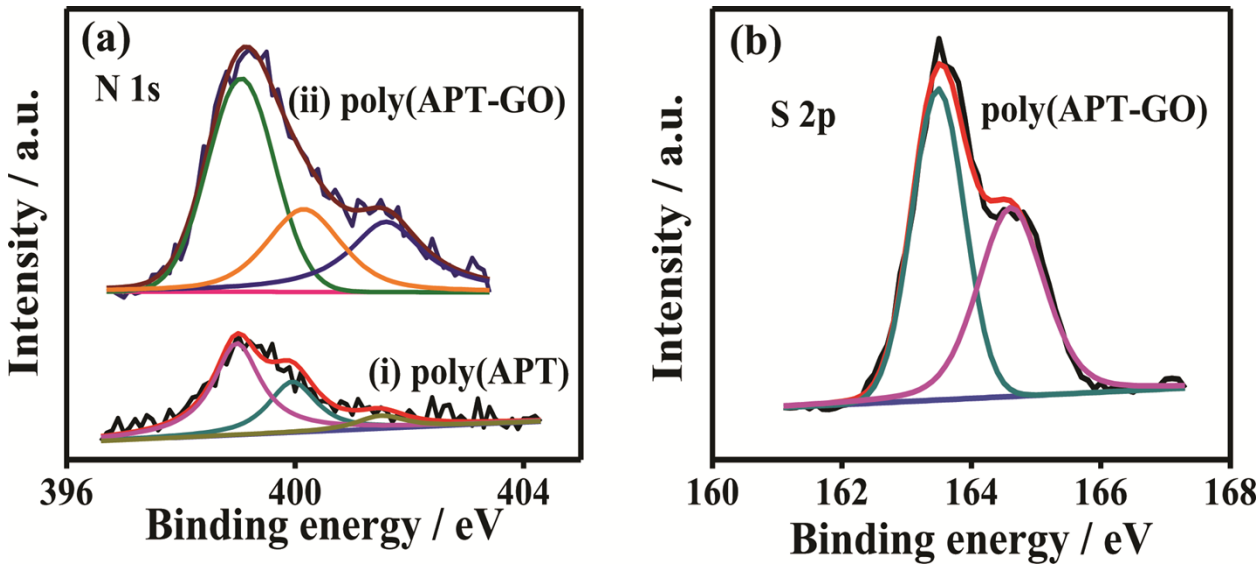



**Figure S3.** (a) XPS high resolution N 1s spectra of poly(APT) (a-(i)) and poly(APT-GO) (a-(ii)), and (b) high resolution S 2p spectrum of poly(APT-GO) sample.

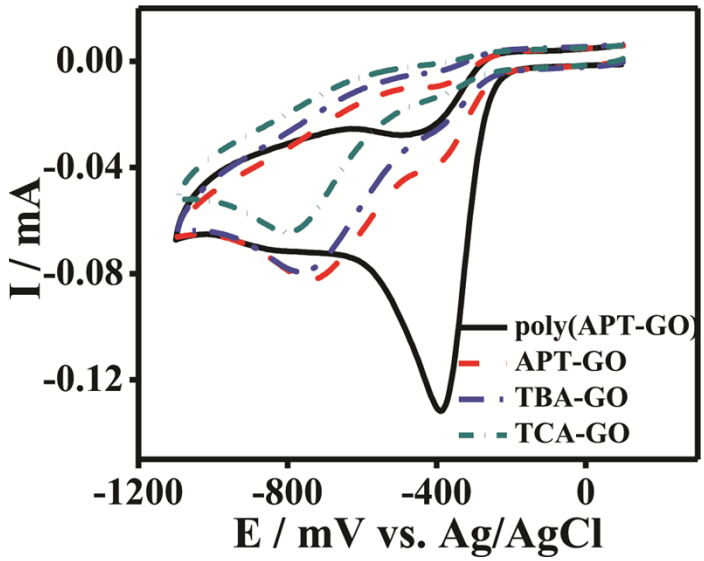



**Figure S4**. CVs recorded for the poly(APT-GO), APT-GO, TBA-GO, and TCA-GO electrodes in $O_2$ saturated 0.1 M NaOH solution at a scan rate of 50 mV/s.

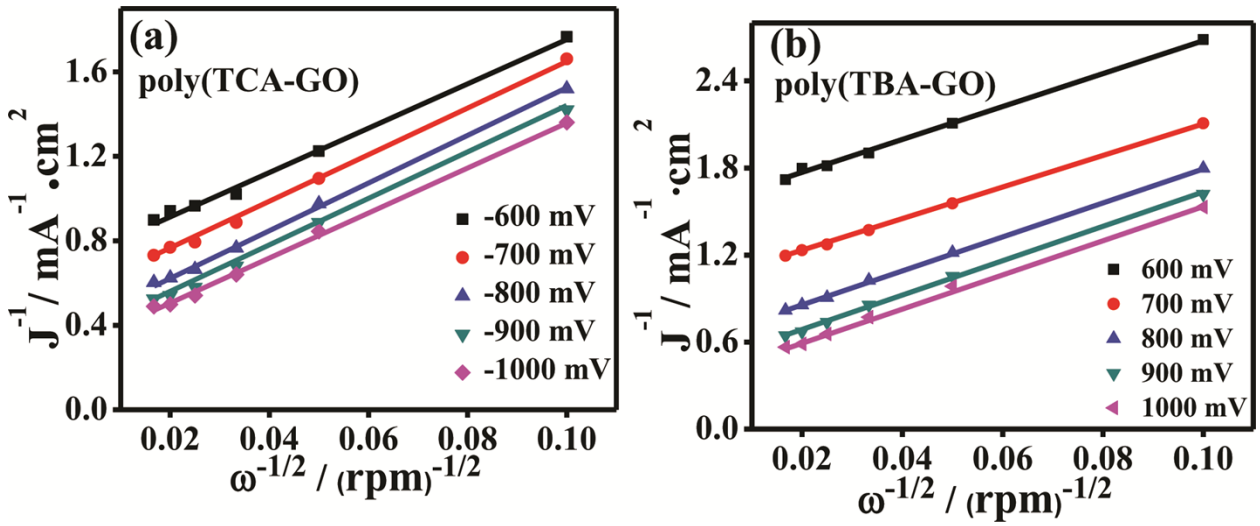



**Figure S5.** Koutecky-Levich plots for (a) poly(TCA-GO) and (b) poly(TBA-GO).

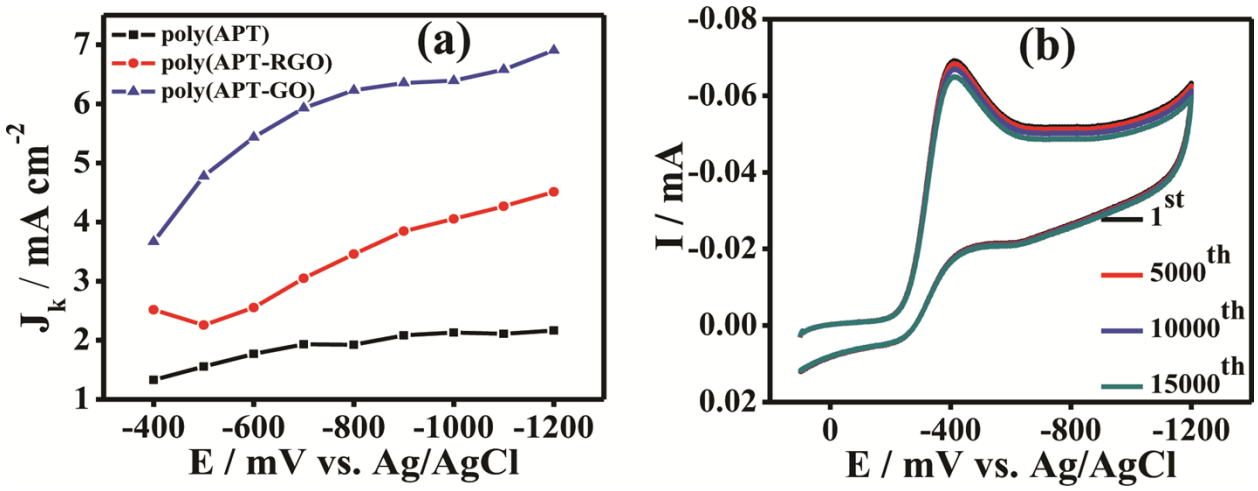



**Figure S6.** (a) Kinetic current density *vs.* potential for poly(APT), poly(APT-RGO), and poly(APT-GO) electrodes, and (b) CVs of poly(APT-GO) electrode for selected continuous potential cycling up to 15000 cycles in a 0.1 M NaOH solution at scan rate of 50 mV/s.