Electronic Supplementary Material (ESI) for Nanoscale.
This journal is © The Royal Society of Chemistry 2018

Electronic Supplementary Material (ESI) for Nanoscale.
This journal is © The Society of Chemistry 2018

Supporting Information

Catalytic degradation of phenols by recyclable CVD graphene film

Je Min Yoo,[a‡] Baekwon Park,[a‡] Sang Jin Kim,[b] Yong Seok Choi,[a] Sungmin Park,[a] Eun Hye Jeong,[c] Hyukjin Lee,[c*] Byung Hee Hong[a*]

[a] Department of Chemistry, Seoul National University, Gwanak_599, Gwanak-ro, Gwanak-gu, Seoul 151-747, Korea

[b] Applied Quantum Composites Research Centre, Korea Institute of Science and Technology, Chungdong-ro 92, Bondong-eup, Wanju-gun, Jeonnbuk 55324, Korea

[c] College of Pharmacy, Ewha Womans University, 11-1 Daehyun-Dong, Seodaemun-Gu, Seoul 120-750, Korea

* Corresponding authors: hyukjin@ewha.ac.kr; byunghee@snu.ac.kr.

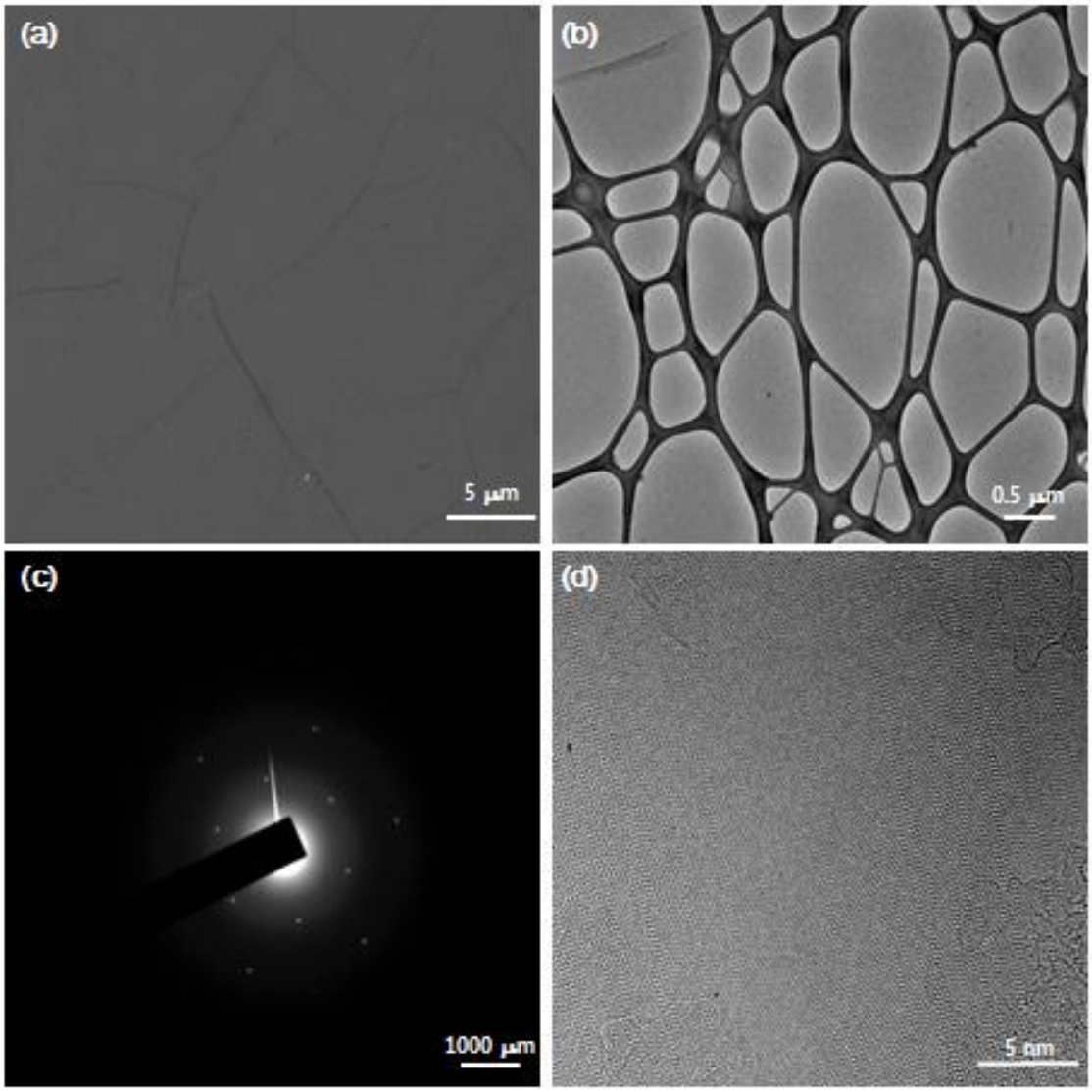

Fig. S1 (a) Representative SEM and (b) HRTEM images of the monolayer graphene film with (c) distinctive SAED pattern. (d) Representative Cs-corrected STEM image of the monolayer graphene.

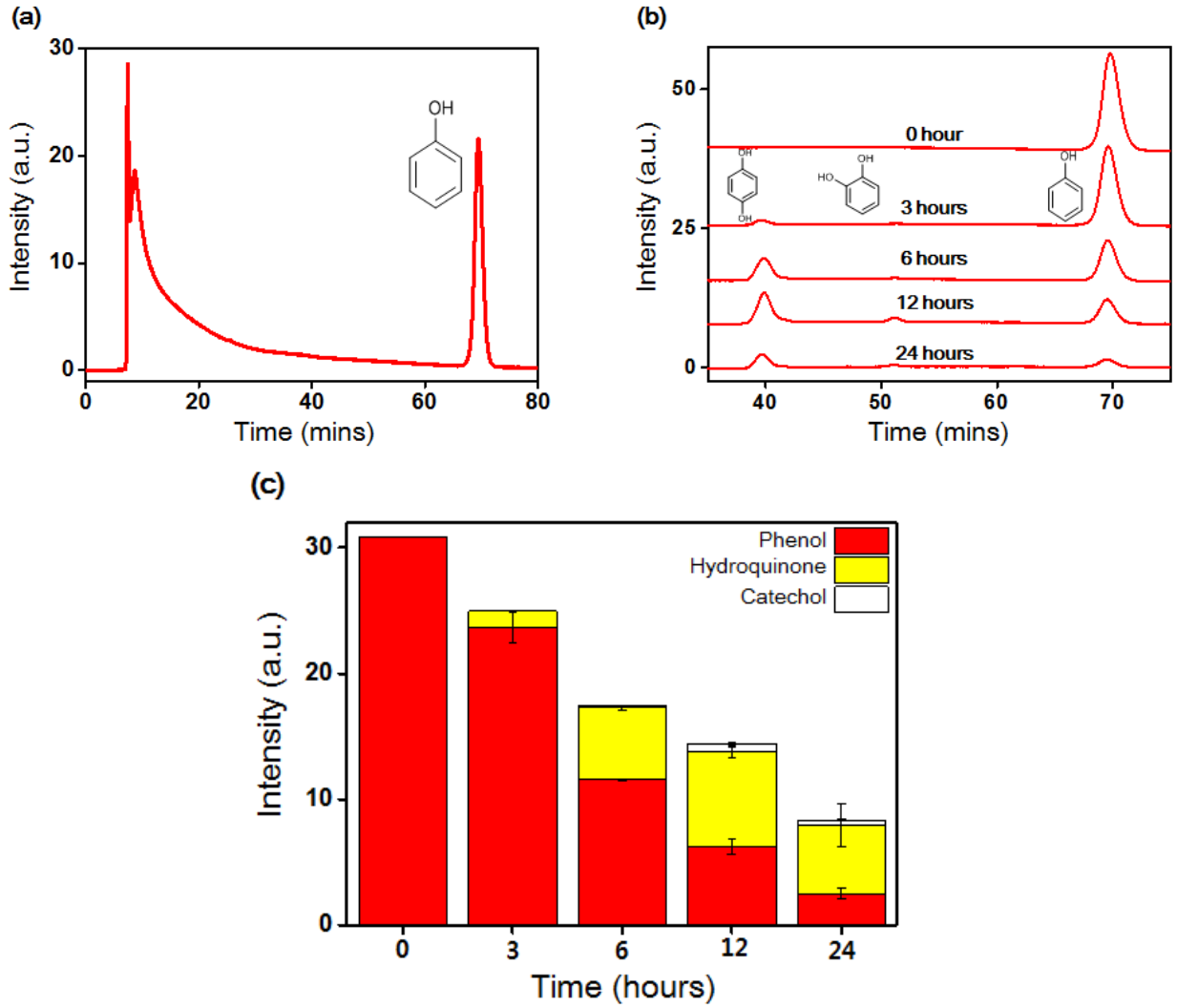

Fig. S2 (a) HPLC analysis of hydrogen peroxide (100 mM) and phenols (1 mM). Hydrogen peroxide show strong, broad signals peaking at 7.43 and 8.65 minutes. (b) Time-dependent HPLC analysis and (c) quantified intensities with 9 cm^2 graphene film after 0, 3, 6, 12 and 24 hours of incubation with 1 mM phenols and 100 mM hydrogen peroxide.

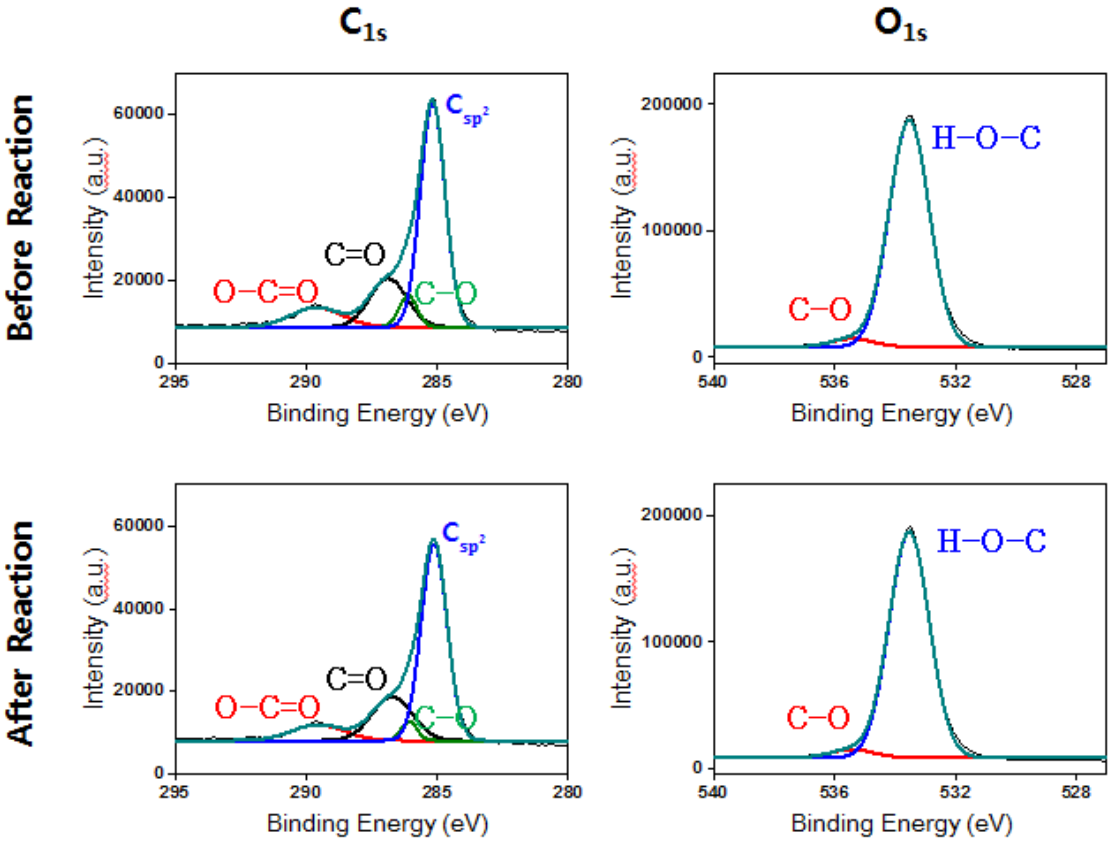

Fig. S3 C_{1s} (left) and O_{1s} (right) XPS analysis pre- and post-phenol degradation respectively from the top. The characteristic C_{1s} signals exhibited distinctive atomic ratio changes from 0.12 → 0.10, 0.2 → 0.22, 0.06 → 0.04 and 0.62 → 0.64 respectively at 289 eV (O-C=O), 286.8 eV (C=O), 286.1 eV (C-O) and 285 eV (C_{sp}^2). Likewise, the characteristic O_{1s} signals displayed atomic ratio changes from 0.04 → 0.04 and 0.96 → 0.96 at 535 eV (C-O) and 533 eV (H-O-C).