Supporting Information

Effective Removal of Pb(II) Using Graphene@Ternary Oxides Composite as Adsorbent in Aqueous Media

*Duong Duc La[a], Hoai Phuong Nguyen Thi[b], Tuan Anh Nguyen[c], Sheshanath V. Bhosale[*a]*

[a.] School of Science, RMIT University, GPO Box 2476, Melbourne, VIC-3001 Australia
[b.] Institute of Chemistry & Materials Science, 17 Hoang Sam, Hanoi, Vietnam
[c.] Applied Nanomaterial Laboratory, ANTECH, Hanoi, Vietnam

Corresponding author*:* Sheshanath V. Bhosale,
Email address: sheshanath.bhosale@rmit.edu.au

This provides further information about the SEM, TEM iamges, EDS spectra and N_2 isotherm from BET study images of the graphene@Fe-Mg-Cu ternary oxide composite. This material is available free of charge via the internet.

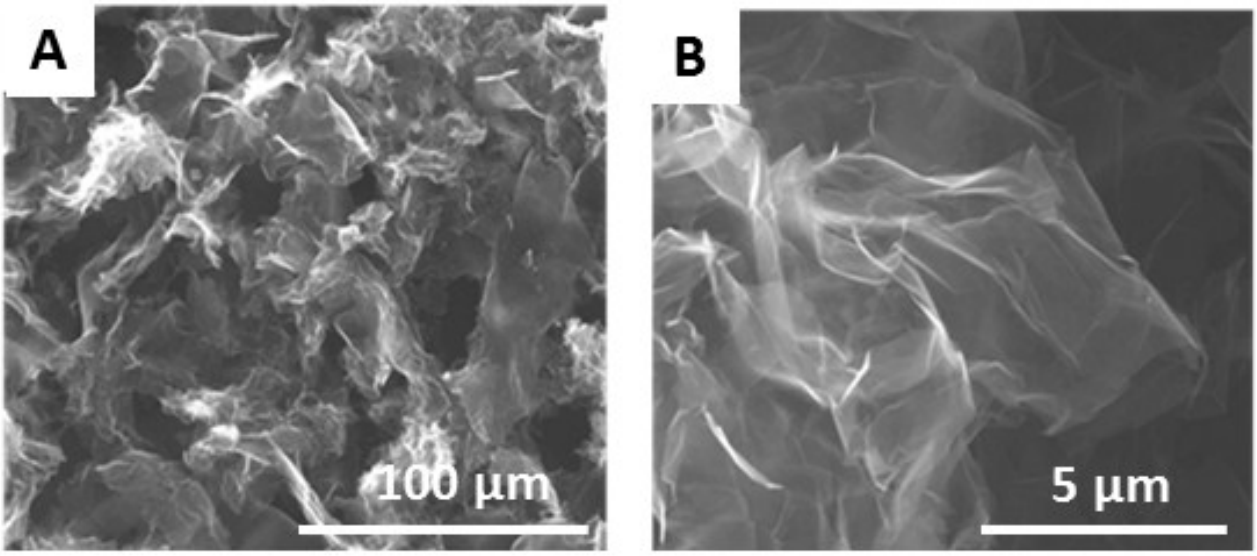

Figure S1. SEM images of the graphene nanoplates

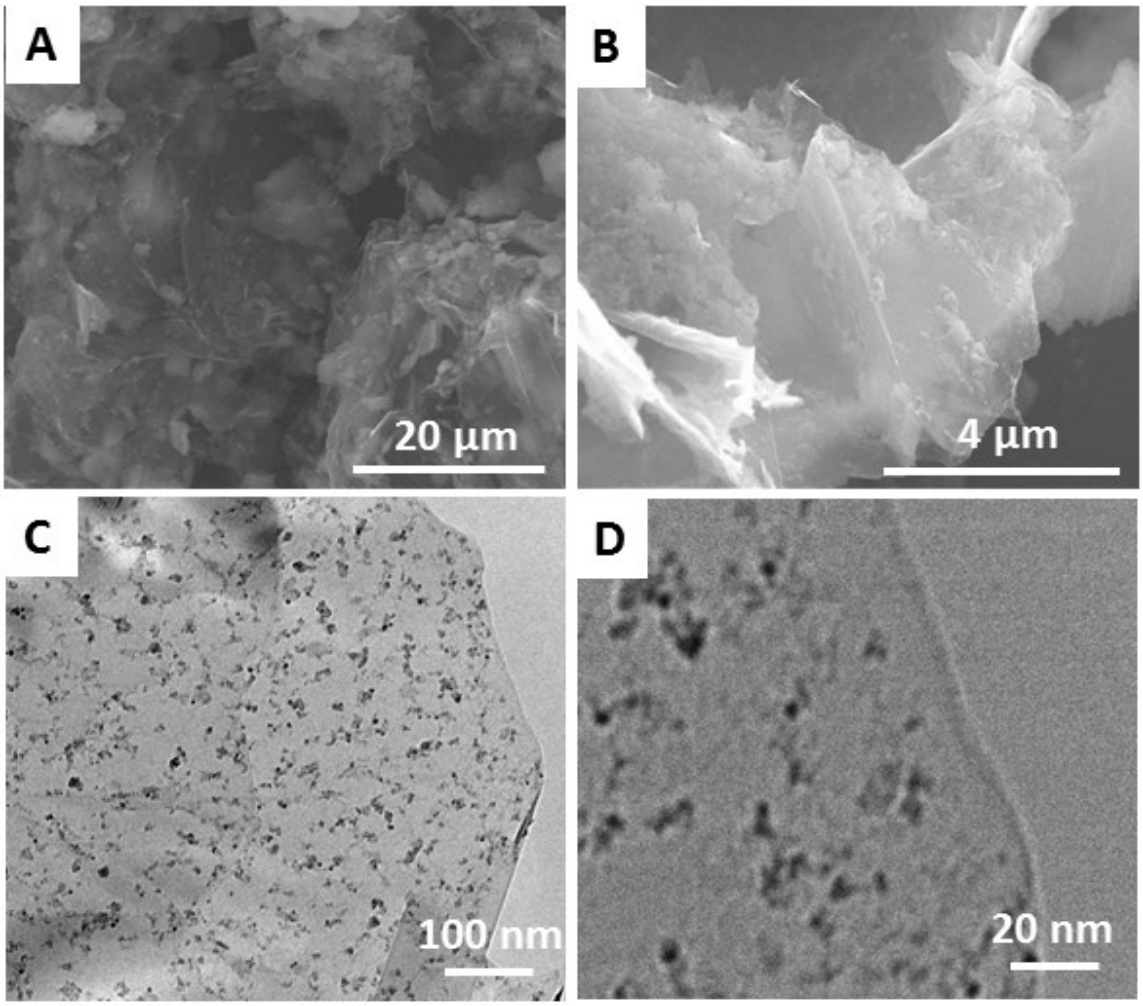

Figure S2. SEM (A,B) and TEM (C,D) images of the graphene@Fe-Mg-Cu ternary oxide composite.

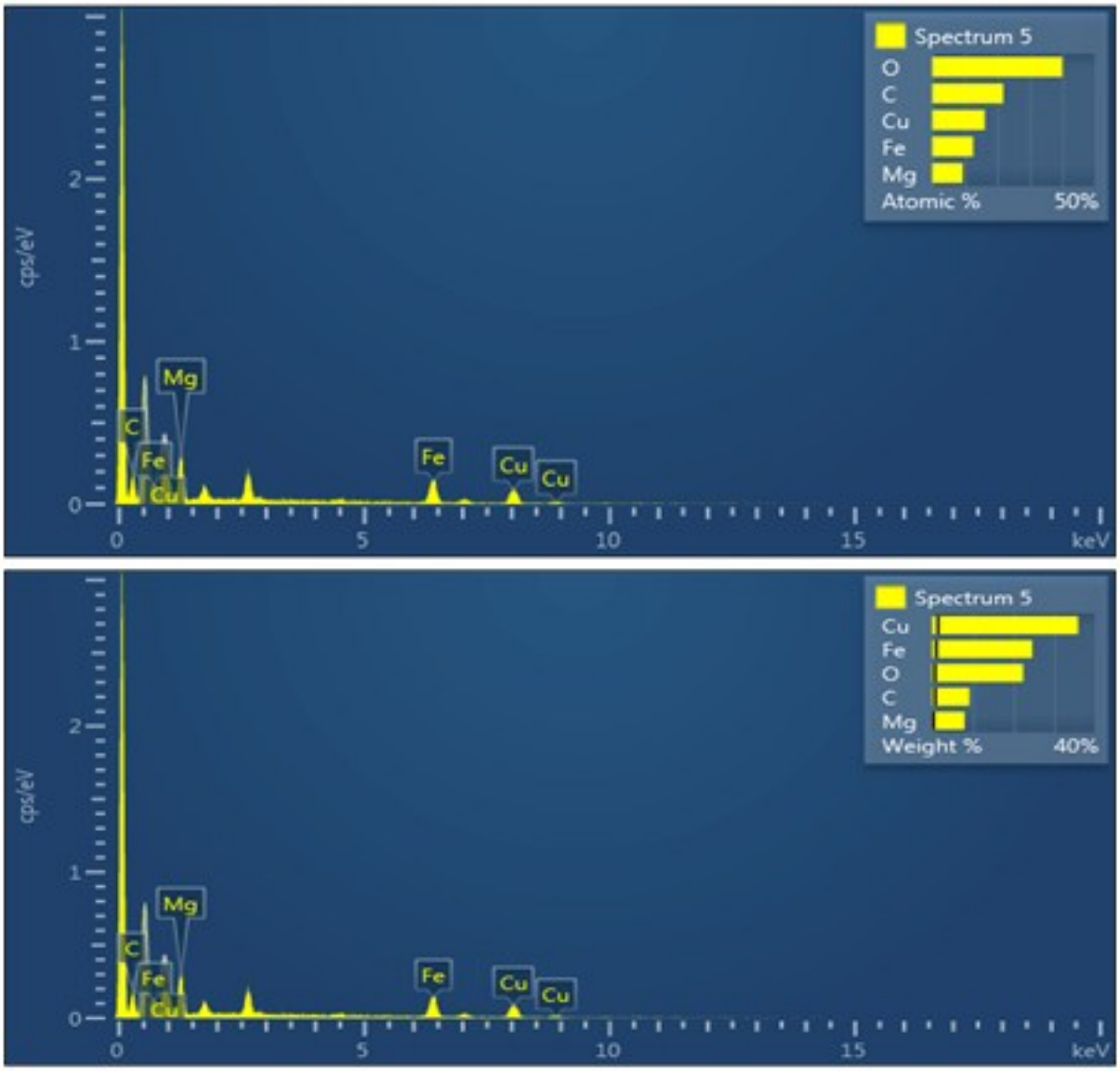

Figure S3. Electron dispersive spectroscopy spectrum of the graphene@Fe-Mg-Cu ternary oxides composite.

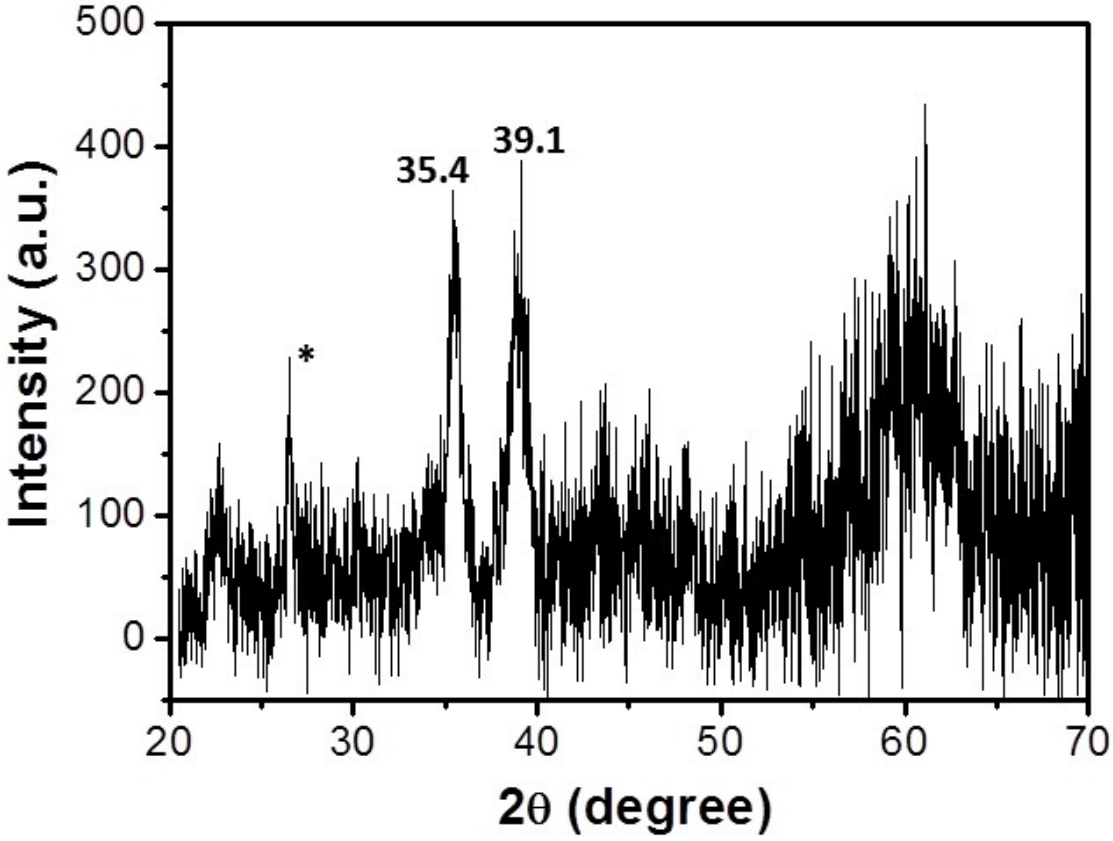

Figure S4. XRD pattern of the graphene@Fe-Mg-Cu ternary oxide composite.

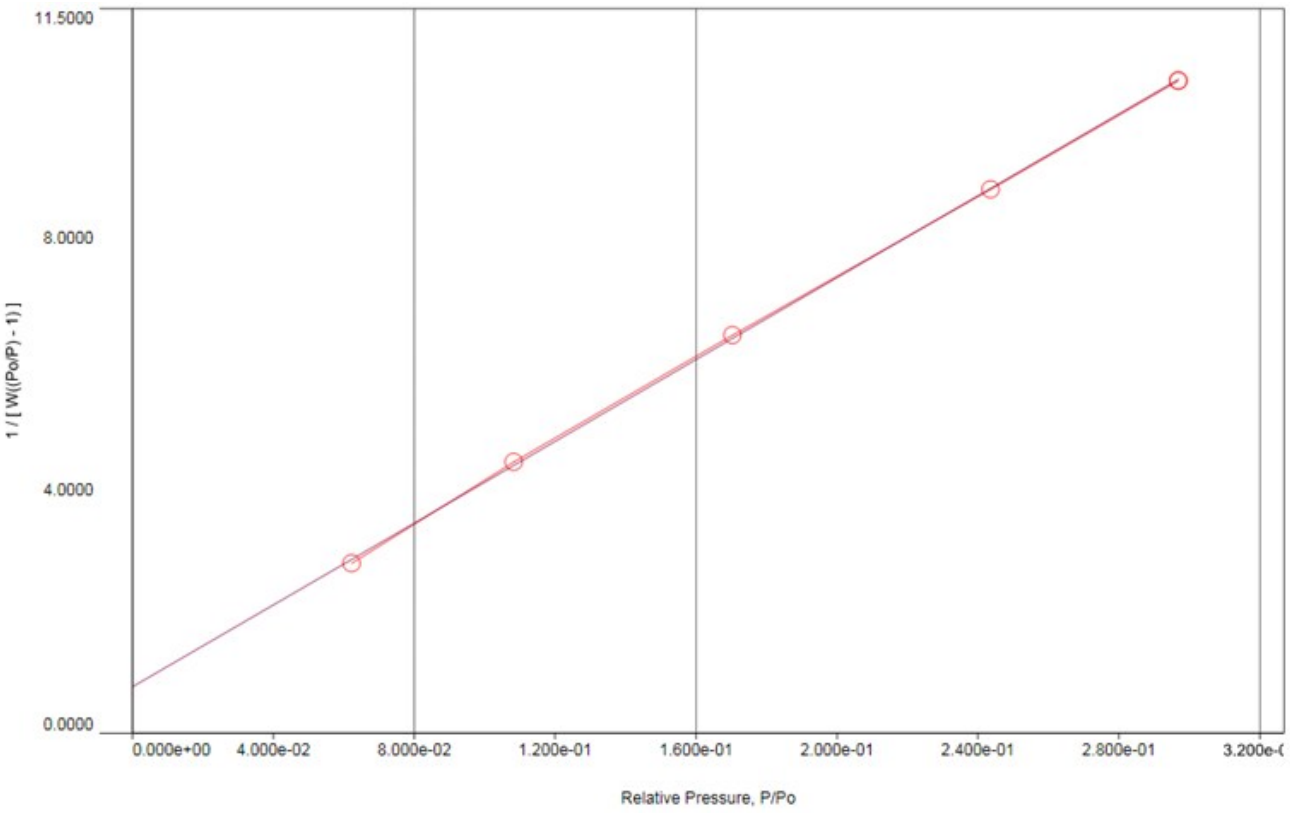

Figure S5. N_2 adsorption/desorption isotherms for the graphene@Fe-Mg-Cu ternary oxides composite.

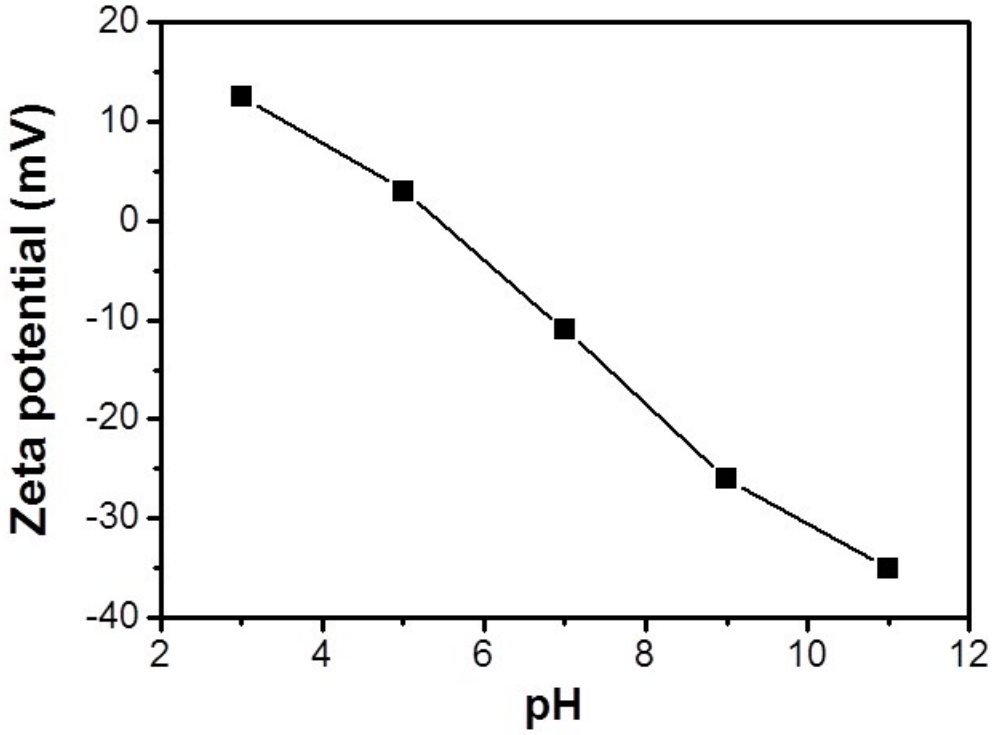

Figure S6. Zeta potential of the graphene@Fe-Mg-Cu ternary oxides composite in various pH.

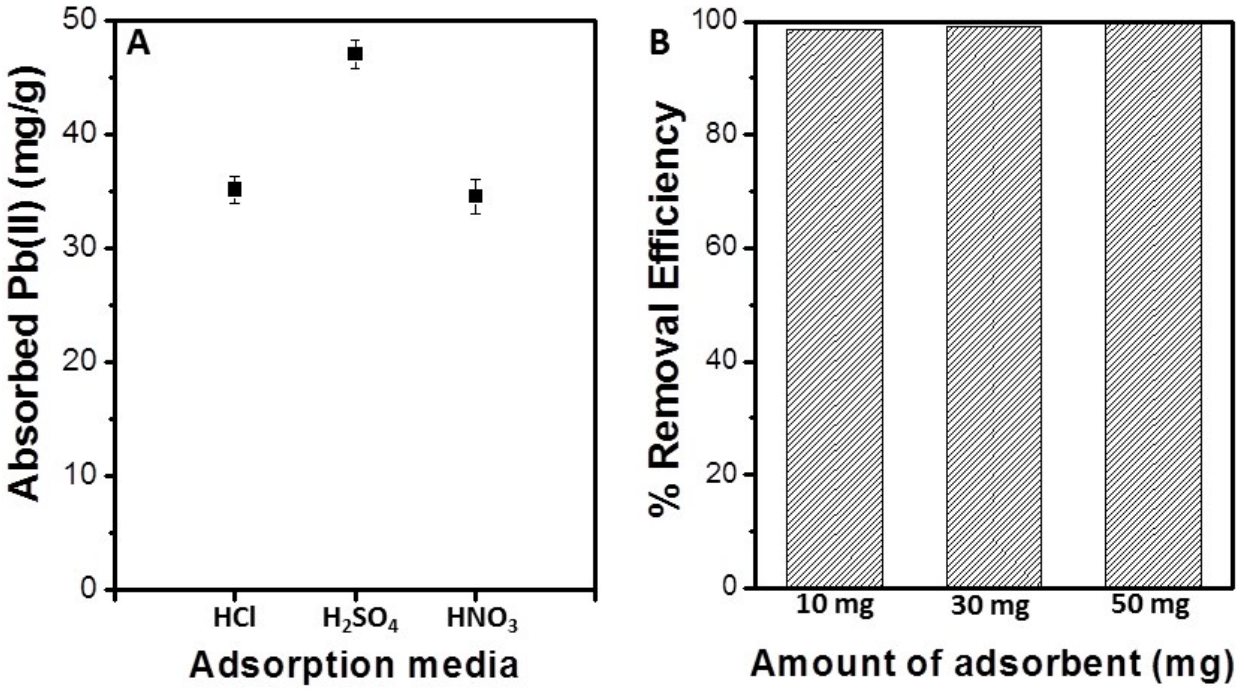

Figure S7. Effects of (A) adsorption media and (B) amount of adsorbent on P(II) adsorption by the graphene@Fe-Mg-Cu ternary oxide composite.

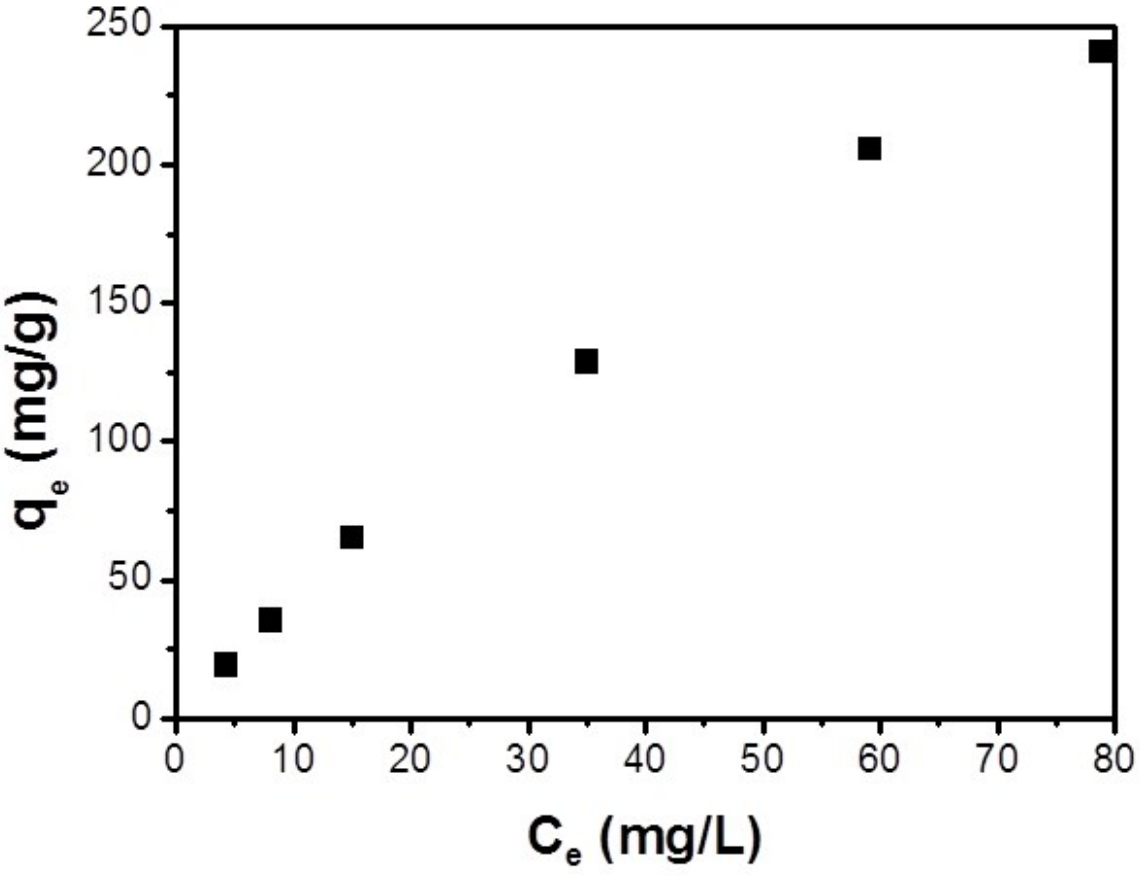

Figure S8. Equilibrium Pb(II) adsorption capacity with various initial Pb(II) concentration

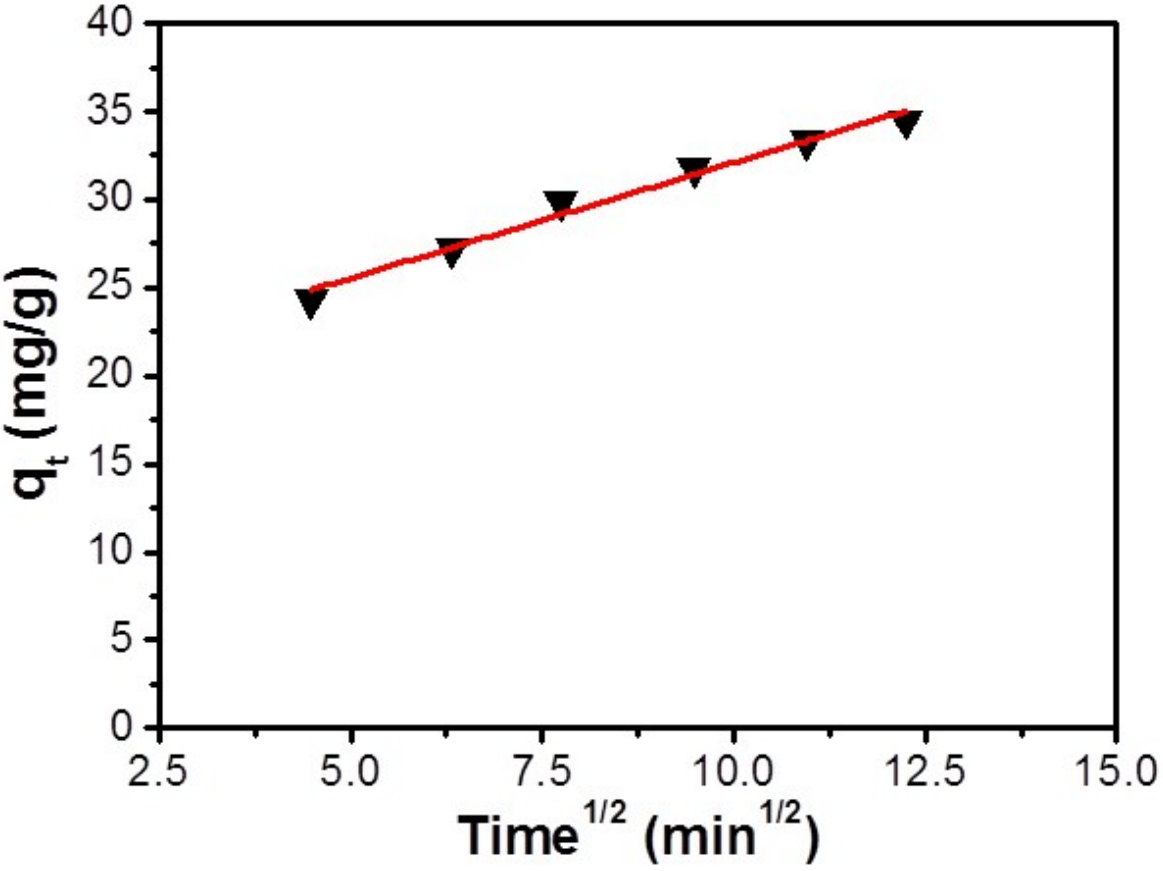

Figure S9. Weber–Morris model.

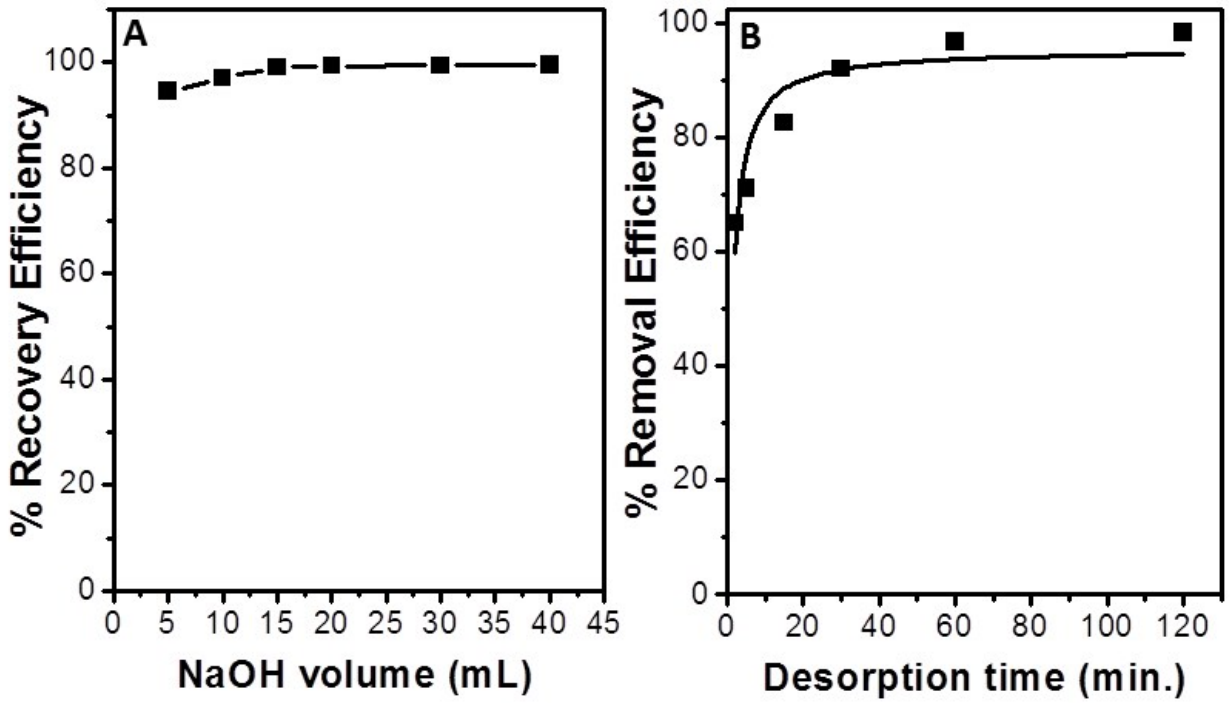

Figure S10. Effect of (A) NaOH volume and (B) Desorption time on the extraction efficiency of adsorbed Pb(II) on the graphene@Fe-Mg-Cu ternary oxide composite.

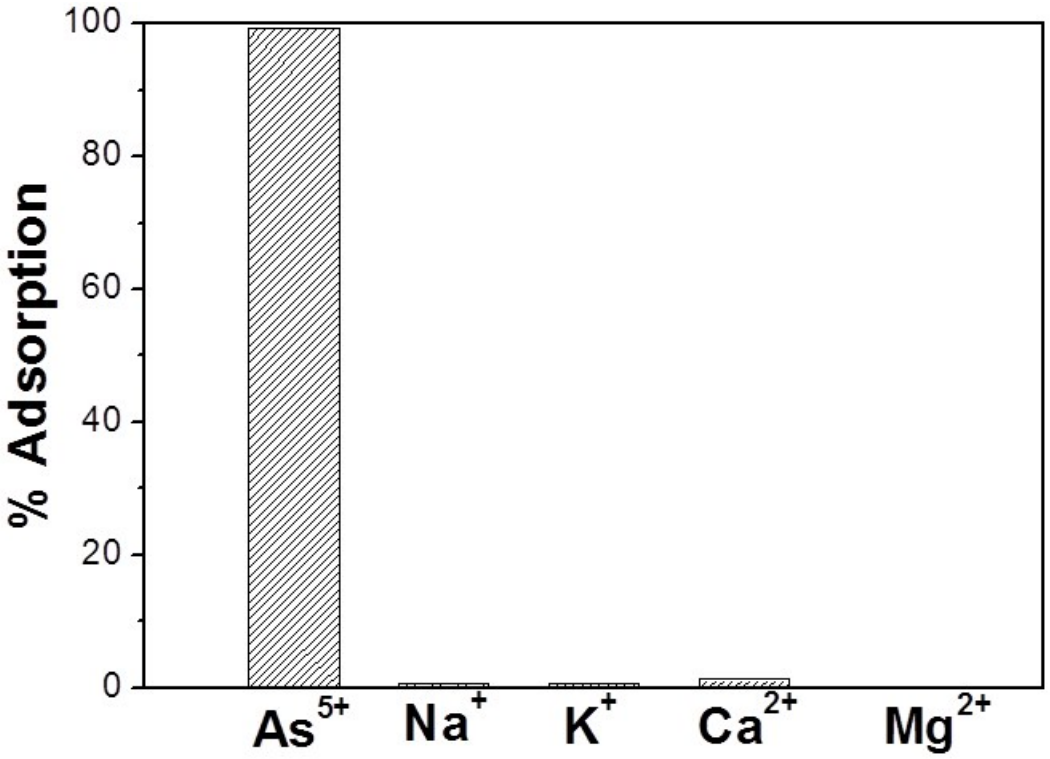

Figure S11. Selectivity of GNPs/Fe-Cu-Mg ternary oxide absorbent toward Pb(II) in the presence of Na^+, K^+, Ca^{2+} and Mg^{2+}. Adsorption condition: Stock solution with concentration of Pb(II) = 3 mg/L, concentration of Na^+, K^+, Ca^{2+} and Mg^{2+} = 3 mg/L, pH = 7, adsorbent = 200 mg/L.