Electronic Supplementary Information (ESI)

N-(4-Aminobutyl)-N-ethylisoluminol/CoFe₂O₄/graphene hybrids

with unique chemiluminescence and magnetism

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Fig. S1 Raman spectra of GO (a), ABEI/CoFe₂O₄/GNs (b) and graphene (c).



Fig. S2 Nitrogen adsorption/desorption isotherms of ABEI/CoFe₂O₄/GNs. Inset: pore size distribution.



Fig. S3 Effect of ABEI (A), $CoFe_2O_4$ (B) and GNs (C) concentration on CL intensity. Effect of $CoFe_2O_4$ (D) concentration on magnetism of ABEI/CoFe₂O₄/GNs.



Fig. S4 Effect of concentration (A) and pH (B) of H₂O₂ on CL intensity.

The CL response increased with H_2O_2 concentration from 0.0001 to 1 mM. When H_2O_2 concentration further increased to 10 mM, and the CL intensity was decreased. Thus 1 mM H_2O_2 was select as optimized conditions for the ABEI/CoFe₂O₄/GNs mediated CL reaction. The CL response increased with solution pH to 13. The higher solution pH will corrode the injector of luminometer and the obtained CL intensity at pH 13 was strong enough, thus pH 13 was select as optimized conditions for the ABEI/CoFe₂O₄/GNs mediated CL reaction.



Fig. S5 CL intensity reproducibility with five batches of the ABEI/CoFe₂O₄/GNs



Fig. S6 I_{ECL}–E curves of ABEI/CoFe₂O₄/GNs under O₂ (a), air-saturated (b) and N₂ (c) atmospheres. Inset: the enlarged I_{ECL}–E curves of a, b and c from -0.6 to -1.3 V. Initial potential, 0 V; high potential, 1.3 V; low potential, -1.3 V. Initial scan direction: negative. Photomultiplier tube voltage: -500 V.



Fig. S7 Effect of pH on I_{ECL} –E curves of ABEI/CoFe₂O₄/GNs. Inset: the enlarged I_{ECL} –E curves of pH 7.43 and pH 8.26. Initial potential, 0 V; high potential, 1.3 V; low potential, -1.3 V. Initial scan direction: negative. Photomultiplier tube voltage: -500 V.



Fig. S8 ECL intensity reproducibility of the ABEI/CoFe₂O₄/GNs with five batches.