Supporting Information

Effect of Fullerol and Graphene Oxide on the Phase Transformation of Two-Line Ferrihydrite

Lixia Yan,†,‡,§ Runliang Zhu,*,†,§ Jing Liu,†,§ Yixuan Yang,†,‡,§ Jianxi Zhu,†,§ Hongjuan Sun,‖ and Hongping He†,§

†CAS Key Laboratory of Mineralogy and Metallogeny/Guangdong Provincial Key Laboratory of Mineral Physics and Materials, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China

‡University of Chinese Academy of Sciences, Beijing 100049, China

§Institutions of Earth Science, Chinese Academy of Sciences, Beijing 100029, PR China

‖Southwest University of Science and Technology, Mianyang, Sichuan, 621010, China.
Figure S1. Characterizations of CNM (e.g., GO and PHF). (A) XRD patterns of CNM, (B) XPS patterns of CNM, and (C and D) AFM height images of CNM. The high O count in XPS patterns show that the CNM were well oxidized.
The modified hummers method:

Briefly, 10 g of High-purity (99%) was added into 230 ml of concentrated H₂SO₄ under the ice bath. Subsequently, 40 g of KMnO₄ was slowly added to the mixture with continuous stirring, and the reaction temperature of the system was kept below 15°C. After that, the temperature was raised to 40°C using water bath with stirring for 30 min. Then, the mixture was diluted by adding 800-1000 mL water, and the temperature of the mixture raised to 98°C at this time. H₂O₂ (5%) was then slowly added to the mixture, and after the cease of the gas evolution, the mixture was filtered. The solid product was washed using HCl (5%) and water until the pH value reached 7. The obtained product was dispersed in distilled water through ultrasonication for nearly 1 h, and the suspension was centrifuged at 5000 rpm for 2 min. Then, the sample (graphene oxide) in the suspension was filtered and dried for further usage.
Figure S2. XRD patterns of Fh and CNM-Fh mixed samples before aging. Fh not transformed in the presence or absence of CNM.
Figure S3. The sedimentation conditions of Fh, 5%GO-Fh, and 5%PHF-Fh before aging. GO dispersed Fh, whereas PHF accelerated the aggregation of Fh particles.
**Figure S4.** SEM images of the aged products of (A) Fh, (B) 5%GO-Fh, and (C) 5%PHF-Fh. \( As = \) Average size.