Electronic Supplementary Information

SDC/OS-LDH composite for highly sensitive fluorescence detection of Fe^{3+} at much low concentration

Rong Guo,[a] Jian Li,[b,]* Lihong Chen,[a] Zihuan Yu,[a] Huiqin Yao,[c,]* Keren Shi,[d] Cuiqing Li,[e,]* Shulan Ma[a,]*

[a]*Beijing Key Laboratory of Energy Conversion and Storage Materials, College of Chemistry, Beijing Normal University, Beijing 100875, China. E-mail: mashulan@bnu.edu.cn.*

[b]*Chemistry & Chemical and Environmental Engineering College, Weifang University, Weifang 261061, China. E-mail: ljwfu@163.com.*

[c]*School of Basic Medical Sciences, Ningxia Medical University, Yinchuan 750004, China. E-mail: huiqin_yao@163.com.*

[d] *State Key Laboratory of High-efficiency Utilization of Coal and Green Chemical Engineering, Ningxia University, Yinchuan 750021, China.*

[e] *Department of Chemical Engineering, Beijing Institute of Petrochemical Technology, Beijing 102617, China. E-mail: licuiqing@bipt.edu.cn*

Materials and Apparatus

4,4'-Stilbenedicarboxylic acid (SDC, 96%) was purchased from Aladdin Industrial Corporation. Sodium 1-Octanesulfonate (OS, 96%) was purchased from purchased from HWRK Chemical Co., Ltd. $Fe(NO_3)_3$ was purchased from Shanghai Macklin Biochemical Co., Ltd. $Zn(NO_3)_2$ was purchased from Tianjin Kemiou Chemical Reagent Co., Ltd. $Mg(NO_3)_2$ (AR), $NaNO_3$ (AR), HNO_3 (AR), Hexamethylenetetramine (HMT) were from Xilong Scientific Co., Ltd. $Al(NO_3)_3$ (AR), $Cr(NO_3)_3$(AR) were purchased from Sinopharm Chemical Reagent Co., Ltd. $Cu(NO_3)_2$ (C.P.), NaOH (AR) were purchased from Beijing Chemical Co. Limited.

The X-ray diffraction (XRD) patterns of solid samples were collected using a PAN alytical X'pert Pro MPD diffractometer with Cu Kα radiation at room temperature, step size of 0.033°, scan time of 20 s per step, and 2θ ranging from 4.5 to 70°. In the small-angle X-ray diffraction, XRD patterns were obtained with the same step size and scan time of large degrees, and 2θ ranging from 0.6 to 6°. The generator setting was 40 kV and 40 mA. The Field emission scanning electron microscopy (FESEM) morphology of LDHs and energy-dispersive spectroscopy (EDS) were observed on S-8010, Hitachi and XFlash 6160, Bruker, respectively. FTIR spectra of KBr disks were acquired using a Nicolet 380 Fourier Transform infrared spectrometer, 32 scans were collected at a resolution of 1 cm^{-1} scanning from 4000-500 cm^{-1}. Fluorescence spectroscopy was performed using an Edinburgh FS5 spectrofluorimeter.

The metal concentrations were measured by inductively coupled plasma atomic emission spectroscopy (ICP-AES, Jarrel-ASH, ICAP-9000). C, H, and N elemental analyses were detected by Elementar vario EL elemental analyzer.

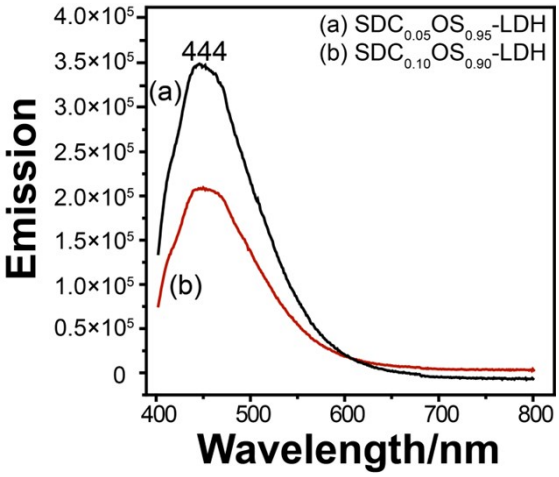

Fig. S1. Emission spectra of the colloidal suspensions in FM of (a) $SDC_{0.05}OS_{0.95}$-LDH and (b) $SDC_{0.10}OS_{0.90}$-LDH (λ_{ex} = 373 nm).

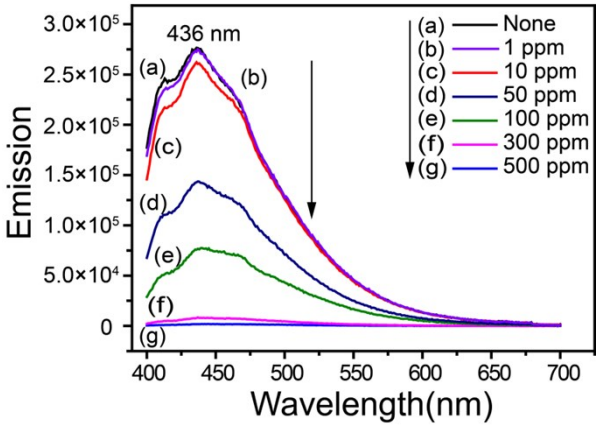

Fig. S2. Emission spectra of $SDC_{0.05}OS_{0.95}$-LDH suspension in FM with the addition of Fe^{3+} at concentrations of 0-500 ppm (3 ml composite colloid + 1 ml FM solutions of Fe^{3+}, which were prepared by dissolving the $Fe(NO_3)_3$ in FM).

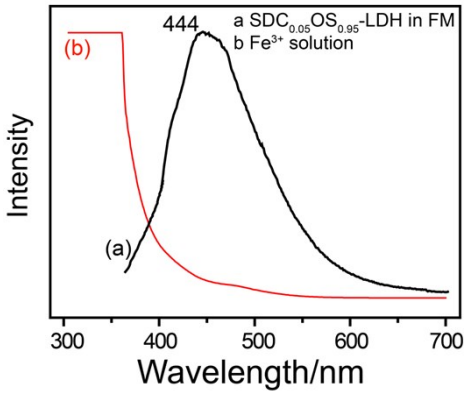

Fig. S3. Spectral overlap between the (a) emission spectra of $SDC_{0.05}OS_{0.95}$-LDH suspension in FM and (b) UV-Vis absorption spectra of Fe^{3+} solution.