*Supplementary document for*

# Decoration of $MnFe_2O_4$ nanoparticles on activated carbon as recoverable photocatayst for perfluorooctanesulfonic acid degradation in water

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***Table S1**. Detailed information of provided activated carbon*

| | | |
|---|---|---|
| **Activated carbon** | Iodine content | 1.041 mg. $g^{-1}$ |
| | Moisture | 2.8% |
| | Bulk density | 506 g. $L^{-1}$ |
| | pH | 6.6 |
| | Grain size | 0.425 – 0.85 mm (98.4%) |

***Table S2**. LC/MS condition for analysis of PFOS concentration during photocatalysis*

| **LC 1290 Infinity - 6430 Triple quad LC/MS Agilent** | | |
|---|---|---|
| **LC condition** | Column | Zorbax Elcipse plus C18 Rapid resolution (id 2.1×50 mm, grain size: 1.8 μm), Agilent |
| | Injection volume | 3 μL |
| | Flow rate | 0.25 mL/min |
| | Mobile phase | A: $CH_3COONH_4$ 5 mmol/L<br>B: $CH_3OH$<br>A:B = 20:80 v/v |
| **MS condition** | Ion source | MMI |
| | Scan type | MRM |
| | Ion mode | ESI |
| | Precursor ion (m/z) | 499 |
| | Product ion (m/z) | 80 (for quantification) |
| | Fragmentor | 135 V |
| | Collision energy | 70 V |
| | Cell Accelerator Voltage | 4 V |
| | Dwell time | 200 msec |
| | Polarity | Negative |
| | Gas flow | 5.1 L. $min^{-1}$ |
| | Gas temperature | 325 $^oC$ |
| | Nebulizer | 60 psi |

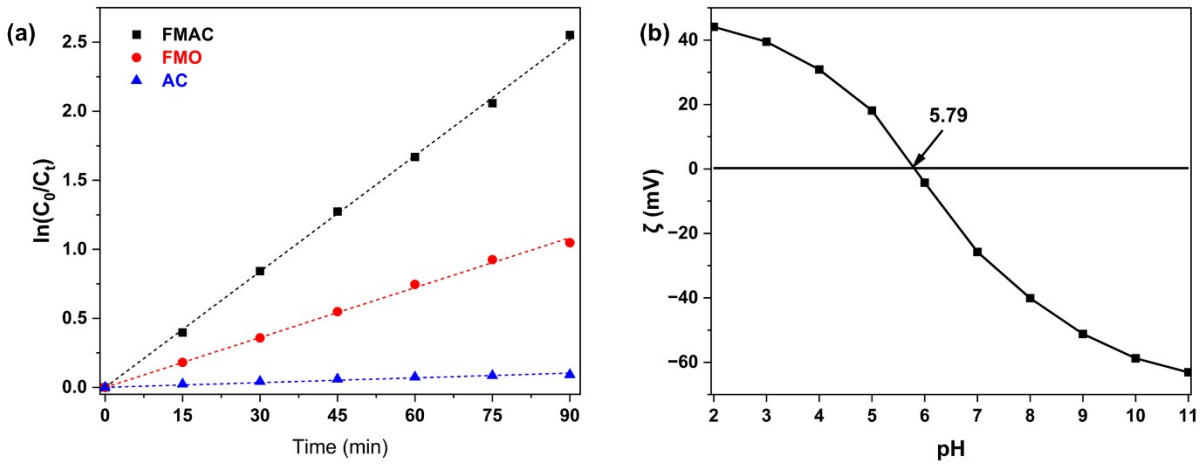


*Figure S1. (a) Fitting of first-pseudo-kinetic model for PFOS degradation using different photocatalysts. (b) ζ potential of FMAC sample at different pH*

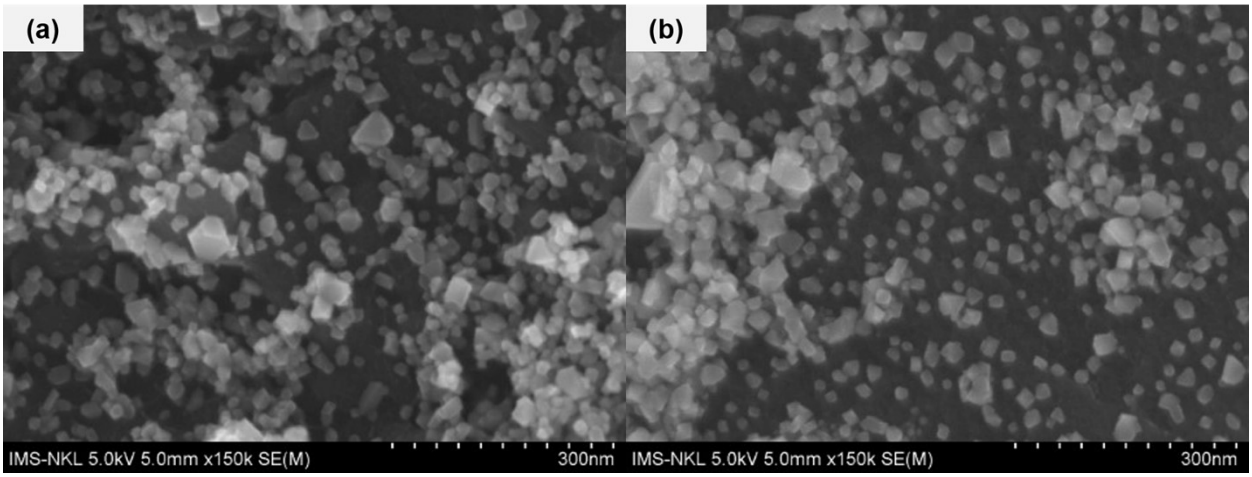


*Figure S2. SEM images of FMAC sample (a) before and (b) after durability test for PFOS photodegradation*