

Supplementary figure:

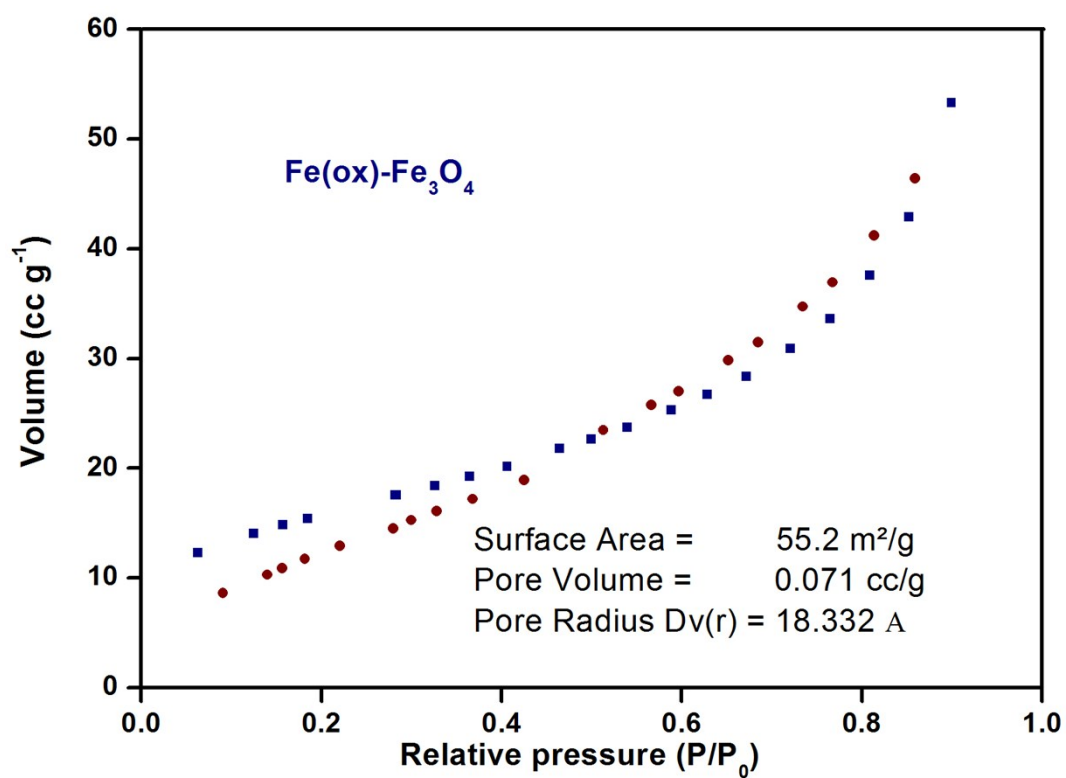


Fig. 1S BET plot for OCIO.

**Supplementary tables:**

<b>Table 1S Surface area, pore radius, pore volume and band gap of OCIO.</b>	
Parameters	Fe(ox)-Fe <sub>3</sub> O <sub>4</sub> (OCIO)
Surface area (m <sup>2</sup> g <sup>-1</sup> )	55.2
Pore Radius (Å)	18.332
Pore Volume (ccg <sup>-1</sup> )	0.071
Band gap (eV)	2.0

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**Table 2S Total bacteiral count in soil treated with OCIO**

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Colony forming unit ml <sup>-1</sup> (×10 <sup>6</sup> )	Initial	90 days
Control	0.1±0.08	0.8±0.06
OCIO	0.4±0.06	2.8±0.1
P value	0.002	
LSD	0.29	

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**Table 3S Effect of synthesized material (OCIO), FeSO<sub>4</sub>, Fe-EDTA and Fe-oxalate in pH change and Fe content (mg L<sup>-1</sup>) release**

pH range	pH change				Fe release (mg L <sup>-1</sup> )			
	12 hrs	24 hrs	48 hrs	72 hrs	12 hrs	24 hrs	48 hrs	72 hrs
OCIO pH 4	6.48±0.05	6.5±0.03	6.53±0.04	6.54±0.2	8.58±0.1	10.73±0.3	15.74±0.1	20.03±0.24
OCIO pH 5	6.52±0.08	6.55±0.04	6.57±0.05	6.6±0.04	10.01±0.2	12.88±0.2	18.5±0.2	22.89±0.3
OCIO pH 6	6.53±0.09	6.56±0.05	6.59±0.04	6.63±0.01	12.88±0.3	15.74±0.3	17.8±0.3	22.89±0.3
OCIO pH 7	7.11±0.05	7.12±0.04	7.15±0.03	7.17±0.1	11.44±0.2	24.3±0.3	25.7±0.3	28.6±0.24
OCIO pH 8	8.13±0.07	8.15±0.03	8.12±0.02	8.13±0.04	15.74±0.3	17.8±0.1	15.74±0.3	17.8±0.2
OCIO pH 9	8.58±0.11	8.58±0.02	8.59±0.02	8.6±0.09	10.73±0.3	15.74±0.2	16.4±0.4	17.8±0.18
Fe-EDTA pH 4	2.34±0.02	2.32±0.01	2.32±0.04	2.3±0.04	10.74±0.3	15.17±0.2	17.03±0.4	20.74±0.26
Fe-EDTA pH 5	2.36±0.05	2.34±0.01	2.33±0.01	2.33±0.02	9.31±0.1	16.6±0.2	19.3±0.4	22.17±0.3
Fe-EDTA pH 6	3.48±0.05	3.44±0.05	3.43±0.01	3.42±0.02	12.04±0.2	15.15±0.2	18.3±0.3	24.33±0.2
Fe-EDTA pH 7	5.46±0.04	5.46±0.01	5.45±0.01	5.44±0.01	17.18±0.3	19.02±0.3	21.17±0.3	24.3±0.22
Fe-EDTA pH 8	6.56±0.03	6.53±0.01	6.5±0.01	6.49±0.02	8.47±0.1	7.89±0.1	5.75±0.1	4.6±0.1
Fe-EDTA pH 9	7.9±0.03	7.89±0.02	7.82±0.05	7.81±0.05	7.31±0.3	7.89±0.2	5.46±0.1	6.89±0.1
Fe-Oxalate pH 4	2.83±0.04	2.8±0.03	2.78±0.04	2.77±0.02	17.17±0.1	18.89±0.4	20.18±0.3	21.33±0.1
Fe-Oxalate pH 5	3.24±0.02	3.2±0.06	3.18±0.05	3.18±0.02	19.31±0.4	23.61±0.4	22.3±0.4	20.03±0.2
Fe-Oxalate pH 6	3.46±0.05	3.45±0.05	3.43±0.05	3.42±0.01	15.04±0.2	26.47±0.4	20.17±0.4	19.2±0.3
Fe-Oxalate pH 7	5.31±0.02	5.3±0.05	5.28±0.05	5.26±0.02	12.89±0.2	26.47±0.3	21.04±0.3	19.17±0.27
Fe-Oxalate pH 8	6.52±0.05	6.51±0.05	6.51±0.06	6.5±0.05	9.45±0.2	9.03±0.3	8.89±0.3	7.44±0.2
Fe-Oxalate pH 9	7.48±0.08	7.47±0.05	7.45±0.08	7.43±0.05	9.29±0.2	8.76±0.3	7.37±0.2	6.16±0.17
FeSO <sub>4</sub> pH 4	4.3±0.02	4.4±0.02	4.3±0.02	4.1±0.3	16.12±0.1	18.27±0.4	20.05±0.3	22.1±0.2
FeSO <sub>4</sub> pH 5	4.8±0.02	5±0.04	5.1±0.03	4.7±0.05	19.56±0.2	20.79±0.4	22.34±0.2	25.1±0.3
FeSO <sub>4</sub> pH 6	5.2±0.02	5.2±0.02	5.4±0.02	5.1±0.03	15.45±0.3	16.35±0.2	15.06±0.1	26.4±0.3
FeSO <sub>4</sub> pH 7	5±0.03	5.2±0.02	5.5±0.02	5.4±0.09	11.45±0.3	13.72±0.2	12.06±0.3	25.1±0.3
FeSO <sub>4</sub> pH 8	4.8±0.02	5.2±0.02	5.4±0.02	5.4±0.06	10.22±0.2	14.29±0.3	12.56±0.4	10.9±0.1
FeSO <sub>4</sub> pH 9	5.5±0.02	5.2±0.02	5.2±0.02	7.21±0.09	10.25±0.3	13.4±0.1	10.63±0.3	5.4±0.1
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSD	0.06	0.03	0.02	0.02	0.14	0.17	0.15	0.20

**Table 4S Physico-chemical characteristics of the test soil**

Soil properties	Mean± Std dev
pH	5.5±0.1
Bulk density (g cc <sup>-1</sup> )	1.42±0.02
WHC (%)	66.5±0.4
Available P (mg kg <sup>-1</sup> )	44.08±1.3
Phosphatase (µg g <sup>-1</sup> h <sup>-1</sup> )	7.85±0.2
Available N (mg kg <sup>-1</sup> )	280.5±0.05
Urease (µg g <sup>-1</sup> h <sup>-1</sup> )	16±0.3
Fe (mg kg <sup>-1</sup> )	124.6±1.2
MBC (µg g <sup>-1</sup> )	58.7±2.9
TOC (%)	0.49±0.04