

## Supporting Information

### Performance and Enhancement of Various Fillers Guiding

### Vanadium (V) Bioremediation

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**Table S1. (a) Information of main chemical reagents used in the study.**

Laboratory reagents	Manufacturer
Ethanol	Beijing Chemical Pharmaceutical Co., Ltd.
Citric acid	Shanghai Aladdin Biochemical Technology Co., Ltd.
2-(5-bromo-2-pyridylazo)-5-diethylaminophenol (5-Br-PADAP)	Shanghai Aladdin Biochemical Technology Co., Ltd.
NaHCO <sub>3</sub>	China National Pharmaceutical Group Corporation
NaVO <sub>3</sub>	Shanghai Aladdin Biochemical Technology Co., Ltd.
HNO <sub>3</sub>	Beijing Chemical Pharmaceutical Co., Ltd.
KH <sub>2</sub> PO <sub>4</sub>	China National Pharmaceutical Group Corporation
H <sub>2</sub> SO <sub>4</sub>	Beijing Chemical Pharmaceutical Co., Ltd.
NaCl	Beijing Chemical Pharmaceutical Co., Ltd.
CaCl <sub>2</sub>	China National Pharmaceutical Group Corporation
NaOH	Beijing Chemical Reagent Factory
KCl	China National Pharmaceutical Group Corporation
KBr	Shanghai Aladdin Biochemical Technology Co., Ltd.
Na <sub>2</sub> HPO <sub>4</sub>	Shanghai Aladdin Biochemical Technology Co., Ltd.
NH <sub>4</sub> Cl	China National Pharmaceutical Group Corporation
C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>	Shanghai Aladdin Biochemical Technology Co., Ltd.
MgCl <sub>2</sub> ·6H <sub>2</sub> O	China National Pharmaceutical Group Corporation

**(b) The main instruments used in the study.**

Instrument	Model	Manufacturer
Spectrophotometer	Cary 5000	Agilent Technologies
TOC analyzer	vario TOC cube	DKSH, Switzerland
Three-dimensional fluorescence excitation emission matrix	Lumina	Thermo
Ultra-pure water machine	arium comfort	Wiggins
ICP-OES	ICAP7200	Thermo Fisher Scientific
Constant temperature incubator	Nicolet Is5	Thermo Scientific
Mixer	Magnetic Stirrer WH-610D	Wiggins

**Table S2. Tests with operation conditions and performance results in this study and previous studies.**

Materials	Carbon source	Microorganism	The initial V concentration	Time	Removal Efficiency	Reference
N/A	Citrate (300 mg/L)	<i>Lactococcus raffinolactis</i>	50 mg/L	10 d	86.5±2.17%	Zhang et al., 2021
N/A	Citrate (6 mM)	<i>Shewanella loihica</i> PV-4	50.6 mg/L	27 d	71.3%	Wang et al., 2017
N/A	N/A	anaerobic sludge	10 mg/L	165 d	99.2±0.6%	Shi et al., 2020
Hydroxyapatite (0.2 g)	N/A	N/A	50 mg/L	30 min	85%	Ali et al., 2021
Amino modified municipal sludge derived ceramic (800 g)	N/A	N/A	50 mg/L	8 h	99.9%	He et al., 2018
Maifanite-1 (10 g)	staw (2.5 g)	anaerobic sludge	75 mg/L	168 h	>99.9%	In this study
Maifanite-1 (10 g)	staw (2.5 g)	N/A	75 mg/L	168 h	52.1%	In this study
Maifanite-2 (10 g)	staw (2.5 g)	anaerobic sludge	75 mg/L	168 h	>99.9%	In this study
Maifanite-2 (10 g)	staw (2.5 g)	N/A	75 mg/L	168 h	60.5%	In this study
Black volcanics (10 g)	staw (2.5 g)	anaerobic sludge	75 mg/L	168 h	>99.9%	In this study
Black volcanics (10 g)	staw (2.5 g)	N/A	75 mg/L	168 h	53.4%	In this study
Green zeolite (10 g)	staw (2.5 g)	N/A	75 mg/L	168 h	66.0%	In this study
Ceramsite (10 g)	staw (2.5 g)	N/A	75 mg/L	168 h	84.8%	In this study
N/A	staw (2.5 g)	N/A	75 mg/L	168 h	52.4%	In this study



**Figure S1. The experimental reactors.**

## References

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