Supporting Information

Nanoscale zerovalent iron coated with magnesium hydroxide for effective removal of cyanobacteria from water

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Section S1. Synthesis of bare NZVI nanoparticles

BNZVI was synthesized by aqueous reduction of $FeCl_3$ with $NaBH_4$. Briefly, a 0.01 M $FeCl_3$ aqueous solution of 71.5 mL was filled in a 250-mL glass reactor. A 0.4 M $NaBH_4$ aqueous solution was added into the $FeCl_3$ solution at a rate of 4.5 mL/min, controlled by a peristaltic pump (LongerPump BT100-2J). During the injection, the solutions were protected in the N_2 atmosphere and stirred mechanically. After a 10-min injection and reaction, BNZVI particles formed in the solution were separated by magnet and washed with water and ethanol sequentially for three times. The ethanol washing was assisted with sonication (40 kHz, 100 W) in the N_2 atmosphere for complete removal of any impurities.

Section S2. Supplementary characterizations and analysis

Figure S1. Photographs of *M. aeruginosa* suspensions: (a) control after standing for 0.5 h; (b) control after standing for 6 h; and (c) after addition of 50 mg/L $Mg(OH)_2$ for 6 h. (Initial cell concentration = 2.5×10^6 cell/mL.)

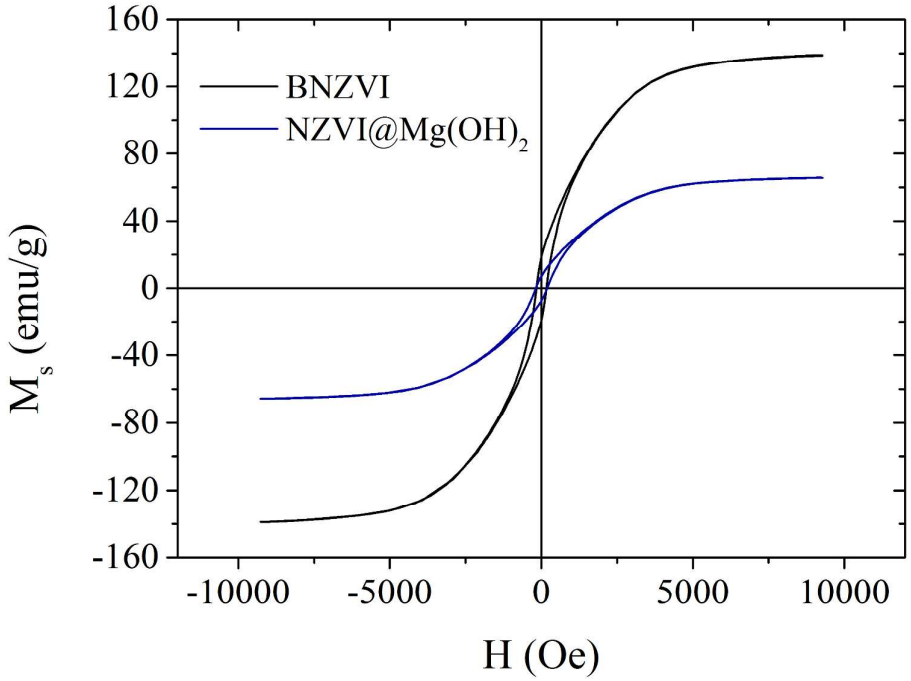

Figure S2. Magnetic field-dependent magnetization values of BNZVI and NZVI@$Mg(OH)_2$.

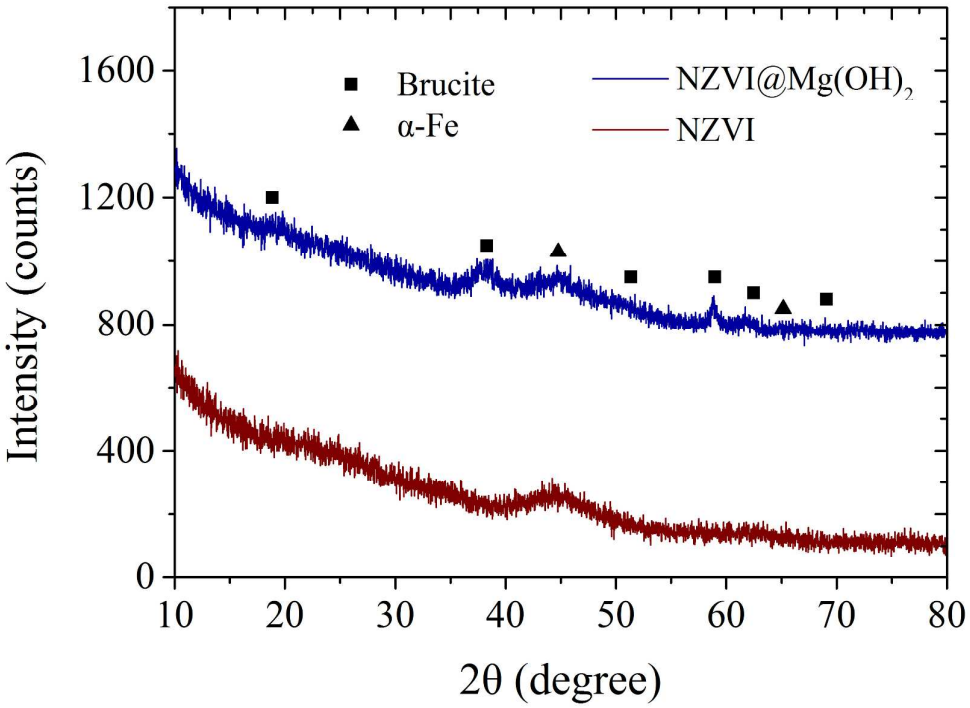

Figure S3. XRD patterns of NZVI and NZVI@$Mg(OH)_2$ particles.

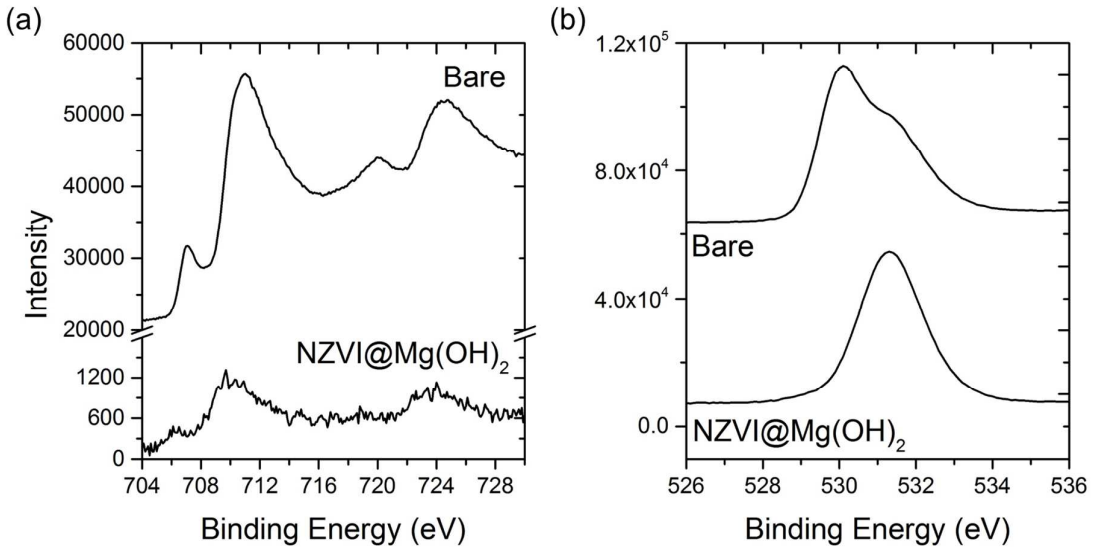

Figure S4. XPS spectra of (a) Fe 2p and (b) O 1s of NZVI and NZVI@$Mg(OH)_2$ particles.

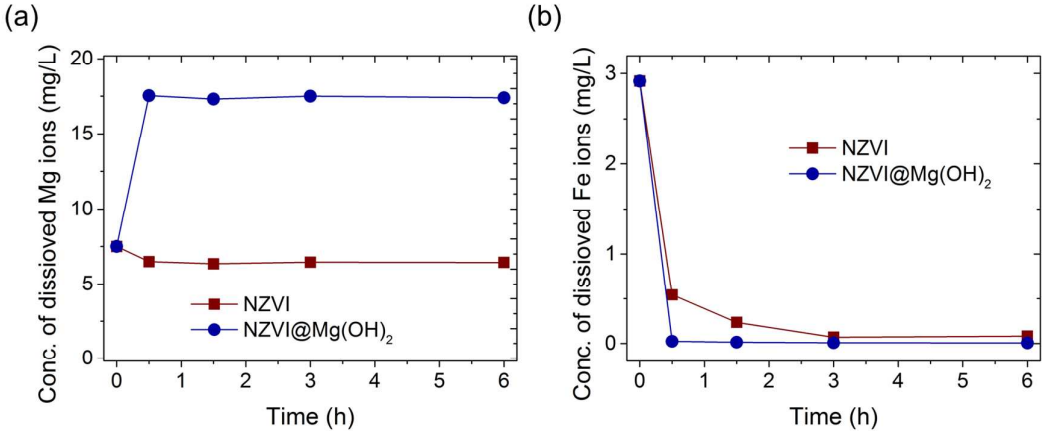

Figure S5. Concentration of dissolved (a) Mg and (b) Fe ions during the cyanobacteria removal tests of NZVI and NZVI@$Mg(OH)_2$ with a NZVI dose of 100 mg/L.

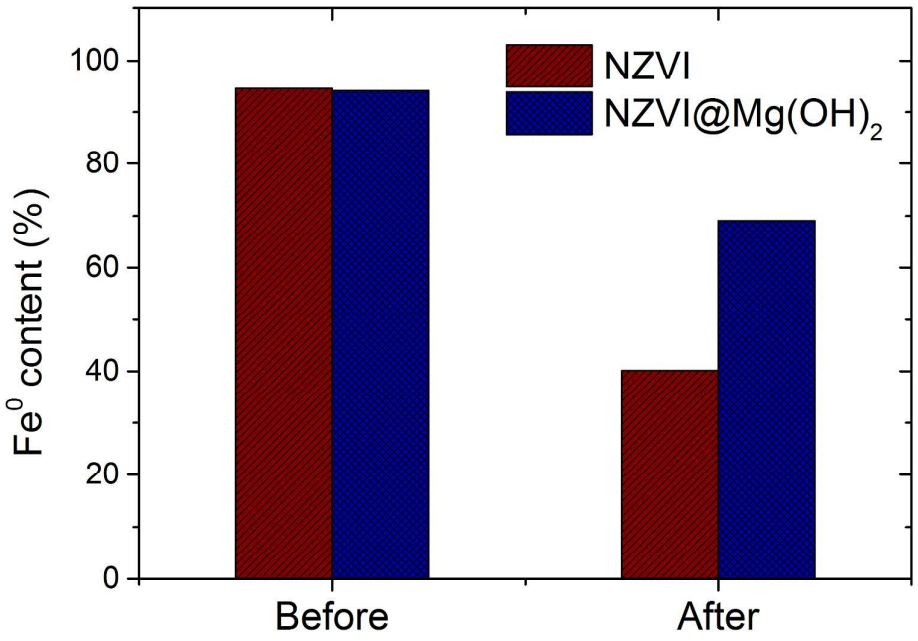

Figure S6. Fe^0 content of NZVI and NZVI@$Mg(OH)_2$ before and after the 6-h cyanobacteria removal tests with a NZVI dose of 100 mg/L.