

Supporting Information

Tribocatalytic degradation of dyes by tungsten bronze ferroelectric

$\text{Ba}_{2.5}\text{Sr}_{2.5}\text{Nb}_8\text{Ta}_2\text{O}_{30}$ submicron particles

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Experimental procedures

Detection of active species Using terephthalic acid (TA) as probe molecule, the friction-induced hydroxyl radical (OH) can be detected by photoluminescence (PL). The 2-hydroxyterephthalic acid produced by the combination of TA and OH has a fluorescence signal at 425 nm at an excitation wavelength of 315 nm. In the experiment, BSNT submicron powders were added to a glass beaker containing 50 mL mixed solution of 0.5 mM TA and 2 mM NaOH. Subsequently, magnetic stirring was carried out with three PTFE stirring rods at a speed of 300 rpm at dark room temperature. After centrifugation at regular intervals, 3 mL of the solution was taken and the fluorescence spectrum was recorded using an Edinburgh FS5 fluorescence spectrometer (UK).

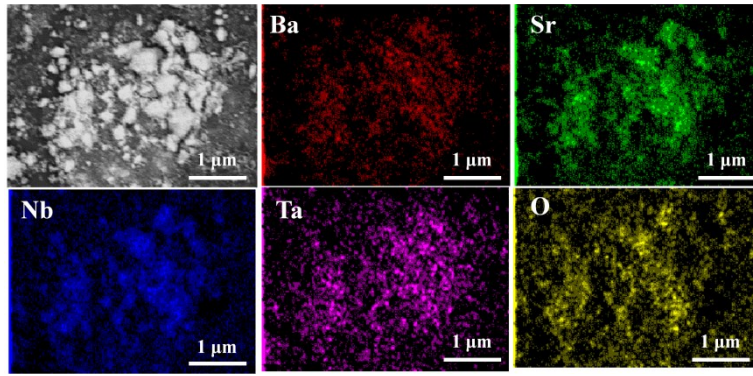


Fig. S1 EDS elemental mapping of Ba, Sr, Nb, Ta and O of the BSNT submicron particles.

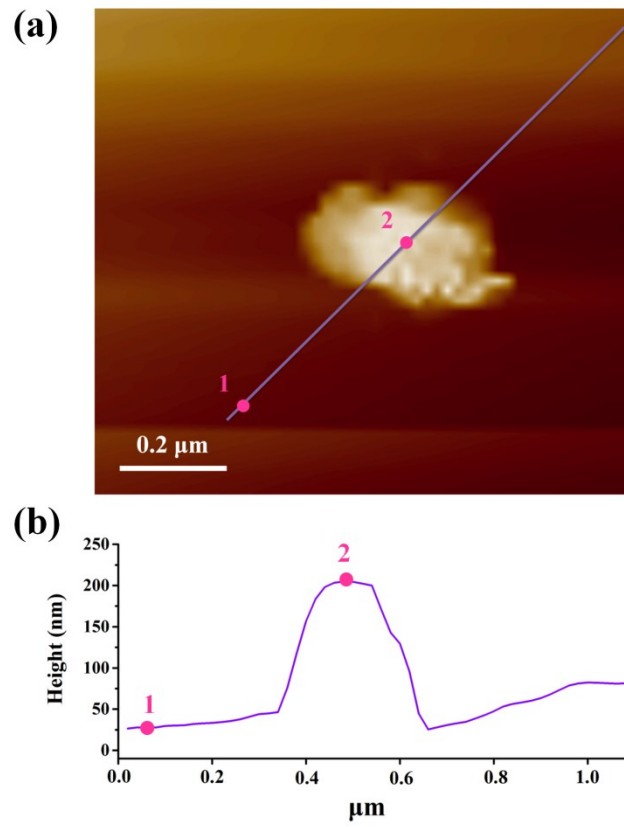


Fig. S2 (a) AFM image of the BSNT submicron particles. (b) Line profile along the purple line in the AFM image, which reveals a thickness of ~ 175 nm.

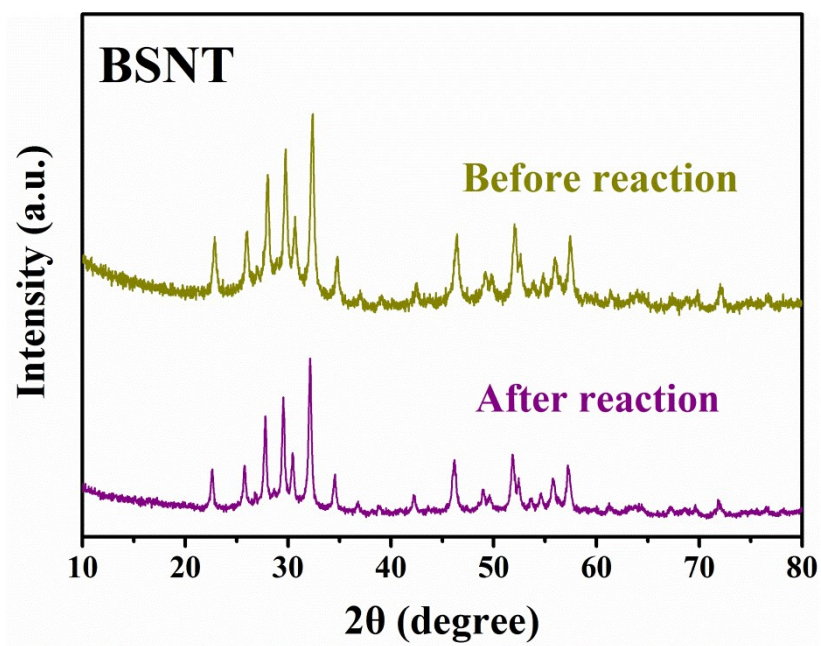


Fig. S3 XRD patterns of the BSNT tribocatalysts before and after tribocatalysis.

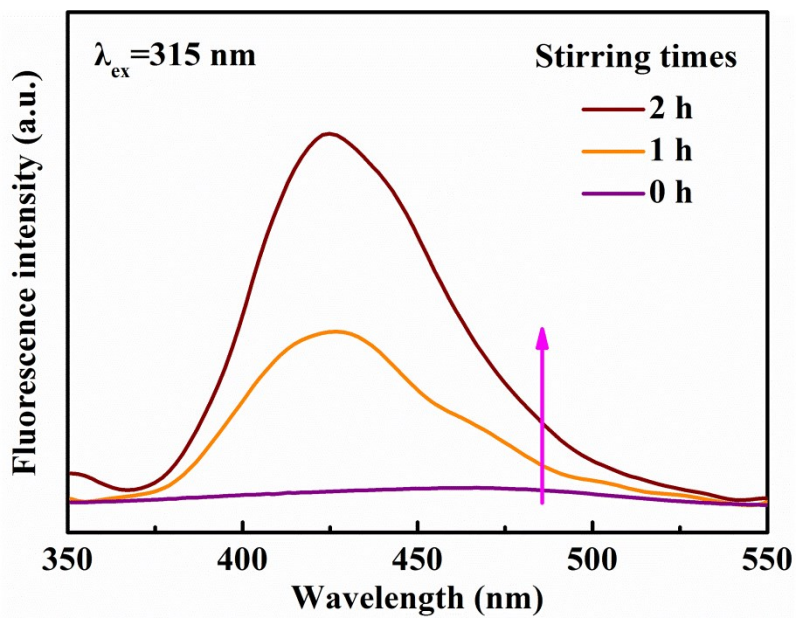


Fig. S4 The $\bullet\text{OH}$ -trapping fluorescence spectra of suspensions containing BSNT and TA under a photoluminescent excitation wavelength of 315 nm.