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# Direct degradation of dyes by piezoelectric fibers through scavenging low frequency vibration

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Highlights

BZT-BCT fibers can scavenge low level mechanical energy to decompose organic dye

The degradation comes from •OH and •O<sub>2</sub><sup>-</sup> generated by the deformation of nanofibers

The degradation efficiency can be greatly enhanced by decreasing fibers' diameters

Provide an effective, practical and low-cost method to decompose organic dye.

**Abstract:** A newly discovered nanometer material-mediated piezoelectrochemical (PZEC) for the direct conversion of mechanical energy to chemical energy has attracted increasing attention, for its great potential to be a green dye water decomposition technique. However, it is far from being a cost-effective and practical technique because only ultrasonic can be scavenged to decomposed organic pollutant in previous studies. Here, we prepared 0.5Ba(Zr<sub>0.2</sub>Ti<sub>0.8</sub>)O<sub>3</sub>-0.5(Ba<sub>0.7</sub>Ca<sub>0.3</sub>)TiO<sub>3</sub> (BZT-BCT) piezoelectric fibers for the degradation of dye solution via slow stirring and studied the degradation mechanism. It provides a practical, green and low-cost method for decomposing organic dye by scavenging waste mechanical energy from the surrounding environment.

**Keywords:** BZT-BCT Fibers, Piezoelectrochemical effect, Degradation of dyes, Scavenging low frequency vibration, Fibers' diameters

## 1. Introduction

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