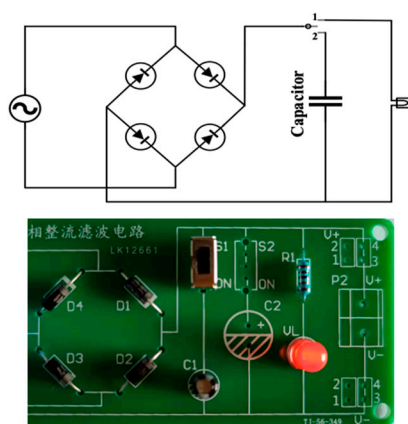


# Synchronous Sound Recognition and Energy Harvesting by Flexible Piezoelectric PLLA/VB<sub>2</sub> Composites

## Supporting Information

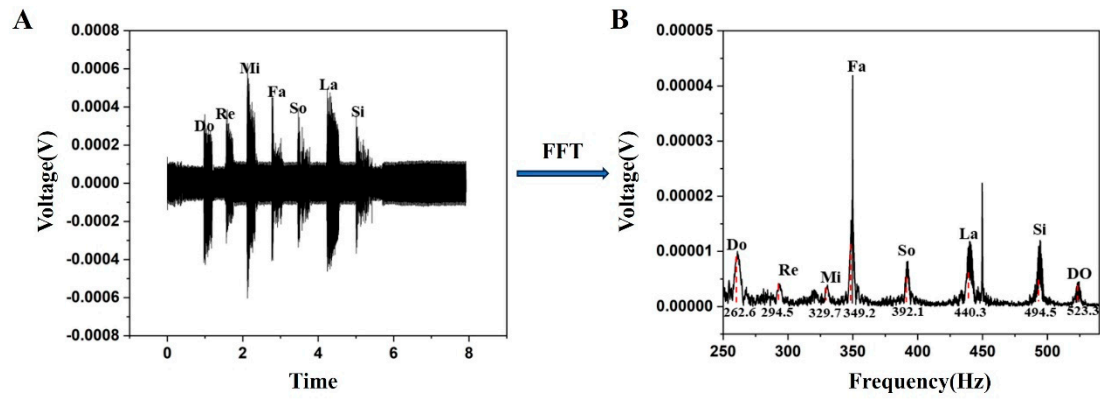
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**Figure S1.** Powering up of LED by energy harvesting of PLLA/VB<sub>2</sub>-15

Seven basic scale samples (Do, Re, Mi, Fa, So, La, Si) were selected to be sounded by a computer-controlled voice system, which excited the PLLA/VB<sub>2</sub>-15 transducer to generate voltage signals, which were sampled by a voltage acquisition card and transmitted to the EAQ-express host computer for display and recording, the results of the experiment are shown in Figure S2(A). As shown in Figure S2(B), the time-domain signals of the seven basic scales were processed by the FFT of the EAQ-express software to obtain the frequency-domain signals (Do: 262.6 Hz, Re: 294.5 Hz, Mi: 329.7 Hz, Fa: 349.2 Hz, So: 392.1 Hz, La: 494.5 Hz, Si: 523.3 Hz), and the seven basic scales corresponded to different frequencies (Do: 262.7 Hz, Re: 294.8 Hz, Mi: 330.1 Hz, Fa: 349.1 Hz, So: 394.1 Hz, La: 494.5 Hz, Si: 523.5 Hz). The frequency domain signals were compared with the standard 7 fundamental scale frequencies, and the relative error of each scale frequency was within 1%. Therefore, this experiment shows that PLLA/VB<sub>2</sub>-15 can be used as a high-performance synchronized speech recognition device.



**Figure S2.** PLLA/VB<sub>2</sub>-15 Response of a sound transducer subjected to excitation by seven fundamental scales (Do, Re, Mi, Fa, So, La, Si). (a) time-domain response; (b) frequency-domain response