Improvement in Performance of Piezoelectric-rubber Using Particles Orientation

Shogo MAMADA Daigo SATO Naoyuki YAGUCHI
Minoru SUZUKI Masanori HANSAKA

Piezoelectric-rubber is expected to use as sensor, actuator and vibration reduction device at places where current piezoelectric ceramics such as lead zirconate-titanate (PZT) cannot be used because of the brittleness. However, piezoelectric performance of current piezoelectric-rubber was not enough to use as practical use. Therefore, we have found out a method by which PZT particles are oriented with keeping the size in order to improve the piezo-electric property. We disperse PZT particles in the uncured silicone rubber as the first procedure of the proposed method. After that, the silicone rubber is cured while applying DC electric field and then PZT particles are surely oriented. By comparing the oriented PZT with the not-oriented PZT, it has been revealed that the orientation of PZT particles contributes to the improvement of piezoelectric performance.