

구조변화에 따른 압전형 마이크로스피커의 모의해석

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Simulation Results of Piezoelectric Microspeakers due to Structural Changes

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Abstract : This paper reports the simulation results of piezoelectric microspeakers due to structural changes(diaphragm materials, corrugation width and electrode shapes). When we compared the dependence of diaphragm material properties, the microspeaker with LTO(Low Temperature Oxide) diaphragm shows higher deflection than that of silicon nitride diaphragm, even though the resonant frequencies are almost same in both cases. In case of circular-electrode microspeaker, the deflection of diaphragm is about 16 μm at 20 V, and it decreases as the corrugation width is decreased. However, the deflection of diaphragm with the square-electrode reveals almost twice times higher value at the same applied voltage than the circular one, and it increases as the corrugation depths are decreased from 30 μm to 10 μm . The first resonant frequency of microspeakers present about 1.8 kHz in circular-electrode and 1.2 kHz in square-electrode, respectively.

Key Words : Piezoelectric Microspeaker, Sound pressure Level, Composite Residual Stress