Abstract:An existing model for the piezoelectric thickness coefficient (d_{33} coefficient) of cellular polymers is tested with experimental data obtained from two differently manufactured cellular polypropylene (PP) materials. The model assumes the cellular film to consist of plane parallel solid and gaseous layers charged at their interfaces. The cellular PP films are expanded by a pressure treatment. Subsequently, due to viscoelastic relaxation, the thickness of the films decreases, thus causing a change of their Young's modulus Y with time. The values of Y are obtained from interferometric measurements of the resonance frequency of the films. Together with the measured thickness of the solid layers and air layers in the material, the d_{33} coefficients can be determined from the model. These values are compared with experimental results for d_{33} also obtained interferometrically by means of the inverse piezoelectric effect. A very good agreement between the measured and calculated d_{33} coefficients as a function of film thickness is obtained for all investigated films.