

Abstract : In this paper, the thermal stability of piezoelectricity of porous polytetrafluoroethylene electret film prepared by unidirectional stretching at suitably high temperature is studied. A very good thermal stability of the piezoelectric coefficient of the porous electret film was found by measuring the surface potential decay, analyzing the open-circuit thermally stimulated discharge current spectra and the elastic modulus as a function of temperature, as well as by investigating the quasi-static piezoelectric coefficient under different conditions. The experimental results point out that the thermal stability of the piezoelectric coefficient depends on both the thermal stability of space charge stored in functional film and the thermal stability of its mechanical properties such as the elastic modulus of the material. The results demonstrate that the continuous service temperature region of the functional devices made of porous electret films is expanded due to their thermal stability