Abstract： Suitable thermal treatments can be used to modify the microstructure of polymer electrets, which in turn may lead to better electret properties. In this paper, non-porous and porous PTFE films are subjected to a thermal treatment consisting of heating at 320℃ for 2 min followed by quenching in liquid nitrogen. The influence of such a treatment on the charge stability of the film electrets is studied by means of thermally stimulated surface-potential decay (charge-TSD) measurements. It is found that the charge stability is slightly reduced by the thermal treatment of non-porous PTFE film electrets, while better electret-charge stability is observed after the thermal treatment of porous PTFE film. The microstructural origin of the observed behavior is investigated and analyzed by means of differential scanning calorimetry (DSC), wide-angle X-ray diffraction (WAXD) and scanning electron microscopy (SEM)