Abstract： The electret properties of virginal cellular polypropylene (PP) films and chemically modified cellular PP films by extraction from CH_2Cl_2 solution, oxidation in a mixture solution of H_2SO_4, CrO_3 and H_2O and fluorination in a hydrofluoric acid (HF) solution, were systematically studied by measuring the open-circuit thermally stimulated discharge (TSD) current spectra, charge TSD spectra and isothermal charge decay. The results point out that there are more deep traps than shallow traps in the surface region while the contrary case occurs in the bulk region. The thermal stability of charge storage of the chemically modified cellular PP film is significantly improved in comparison with that of the virginal one. Light irradiation or reacting at elevated temperature has remarkable promotion effect on the reaction of HF with the extracted and oxidized film. Moreover, a method for investigating the dynamic changes of mean charge depth relative to its initial value during heating was proposed.