

Abstract: In this paper, four kinds of materials (EVA with carbon black particle doped, Al, Cu and Au) were separately used as the electrode material with LLDPE sample in the space charge injection experiment. The results showed that samples with EVA electrode had larger amount of injection than the samples with metal electrodes. It's also found that metal electrode with larger work function would lead to smaller charge injection amount. In order to investigate the difference between EVA and the metal electrode except for their work function, a mode was built from the aspect of micro-structure of them. In this mode, the metal electrode was built with closed piled sphere, the diameter of the sphere is 4 nm, and the EVA was composed of loose piled sphere with diameter of 40 nm which was equal to the size of carbon particle in EVA. By the analysis of finite element, it's found that spheres in the EVA had larger local electric field and high electrical field region than the ones in the metal, so it's easier for the charge to be injected into the sample in EVA material with carbon black doped.