

Abstract: Space charges formed in low-density polyethylene (LDPE) are usually considered to be one of the most important factors in ageing and breakdown mechanism of polymer. But the source of space charge and accumulation process are still ambiguous. In this paper, a polyvinyl fluoride (PVF) film was used as a blocking layer to study the mechanism of space charge injection in LDPE under high direct current stress. The space charge distributions in LDPE specimens with and without the blocking layer are measured by pressure wave propagation (PWP) method. The experimental results indicated that: (1) PVF film could effectively prevent both of the hole and electron injection from electrodes; (2) charge injected from the electrode is the dominant source of space charge accumulation in our LDPE specimens. (3) different preparation conditions can make the specimens exhibit different charge injection characteristics.