

Abstract: Substituted benzene-1, 3, 5-tricarboxylic acid trisamides are known to be efficient nucleating agents and in some selected cases are clarifiers for isotactic polypropylene (i-PP). In this paper we expanded the application range of this class of additives to the area of i-PP electret materials. This paper discusses in particular the relation between charge storage properties and additive concentration. Furthermore, attention is directed towards processing conditions, which were found to play an important role and seemed to be related to the dissolution and crystallization behavior of these additives from the i-PP melt. The formation of isolated nanometer-sized supramolecular structures was established to be important. It was found that, with the addition of benzene-1,3,5-tricarboxylic acid-(N-cyclohexyl)-trisamide, the charge storage properties of i-PP films can be improved at concentrations below 0.02 wt% (200 ppm). At such low concentrations, the additive appears to be present as isolated nano-aggregates, which can, therefore, efficiently act as charge traps. A further improvement in electret characteristics can be achieved by increasing the cooling rate of the polymer/additive blends. A clear correlation between nucleation efficiency and charge storage efficiency could not be revealed.