Thermophysical Properties of Hole Transport Materials for OLEDs

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Organic light-emitting diodes (OLEDs) have been the subject of intense studies due to their application in imaging and light technology. Nowadays, organic semiconductor devices are already used for replacing some inorganic based devices in television set screens, computer monitors, in small portable system screens such as PDAs, watches and mobile phones. Thus, it is expectable that the applicability of these devices, both in terms of variety and amount, will rise in the next future. Hence, the study and control of the thermophysical properties of organic semiconductor materials are important for the performance development and evaluation of the materials/devices, especially in what concerns their phase and thermal stability. In this work, the thermophysical properties and X-ray structural analysis of some hole transport materials, derived from polyphenylamines, were evaluated. For each compound, the thermal stability was evaluated by thermogravimetry. Their fusion temperatures, molar enthalpies and entropies of fusion were derived by differential scanning calorimetry. Also, the heat capacities in the solid phase, at $T=298.15\,\text{K}$, were measured, using a precise heat capacity drop calorimeter.