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测试理论与技术

渡越时间方法测量系统研究

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摘要：载流子迁移率是半导体材料的一项重要参数,而有机材料的载流子迁移率较低,限制了一些传统方法的使用。文章建立了一套用于测量有机材料载流子迁移率的渡越时间(TOF)法实验系统,着重介绍了实验系统中各元件的作用及要求,实验关键技术参数等。该实验系统的主要特点是把激发光源同时作为外触发光源,消除实验中杂散信号的干扰,得到清晰的信号。同时利用实验系统对无机材料Se,有机共轭聚合物材料MEH-PPV的载流子迁移率进行测量,结果表明:该实验系统组建方便,快捷,可以较好地用于测量有机材料低载流子迁移率,具有一定的实用价值。

关键词：渡越时间 载流子迁移率 Se MEH-PPV

#### Measurement System of Time-of-Flight Method

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Abstract: Carrier mobility is an important parameter for semiconductor materials, however, the low carrier mobility of the organic materials limits the applications of some conventional methods in these materials. In this paper, the time-of-flight (TOF) experiment system is developed to measure the carrier mobility of organic materials. The role and requirements of each component in the experiment system and the key technical parameters of the experiment are introduced. The main feature of the experiment system is that a laser is employed as an excitation light source at the same time as the external trigger mode, to eliminate the disturbance from stray signal and get a clear signal. The carrier mobilities of the inorganic material Se and the organic conjugated polymer material MEH-PPV were characterized by this experiment system, which confirmed it is rational and success. Experimental results show that our experiment system could be set up fast and conveniently in measuring the low carrier mobility of organic materials. It will be valuable for practical applications.

Keywords: TOF carrier mobility Se MEH-PPV

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