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反气相色谱法测定环氧树脂的表面张力和溶解度参数

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Characterization of the surface tension and solubility paramet inverse gas chromatography

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摘要 采用反气相色谱(IGC)测定了环氧E51树脂在30、40、50和60 ℃下的表面张力和溶解度参数。采用Schultz法,以正癸烷、正烷和正庚烷为非极性溶剂探针,计算了不同温度下环氧E51树脂的色散表面张力。根据Good-van Oss方程,以甲苯为碱性探针,二氯针,计算得到环氧E51树脂的极性表面张力。结果表明,环氧E51树脂的色散表面张力和极性表面张力均随着温度的升高而线性降低。剂探针与树脂间的Flory-Huggins相互作用参数,采用DiPaola-Baranyi和Guillet方法计算得到环氧E51树脂在不同温度下的溶解度30、40、50和60 ℃下分别为11.78、11.57、11.48和11.14 MPa1/2。根据表面张力、内聚能和溶解度参数的相互关系,计算得下溶解度参数的色散和极性分量。结果发现,环氧E51树脂的溶解度参数的色散分量大于极性分量,且均随着温度的升高而降低。

关键词： 反气相色谱 表面张力 溶解度参数 环氧树脂

Abstract： Inverse gas chromatography (IGC) was used to measure the surface tension and solubility param epoxy resin in this work. By using the Schultz method, decane, nonane, octane and heptane were chosen as probes to calculate the dispersive surface tensions (γD). Based on the Good-van Oss equation, the specific su tension (γSP) of E51 epoxy resin was calculated with the acidic probe of dichloromethane and the basic probe toluene. The results showed that the γD and γSP of the E51 resin decreased linearly with the increase of tem According to the Flory-Huggins parameters (χ) between the resin and a series of probes, the solubility parame E51 resin at different temperatures were estimated using the method developed by DiPaola-Baranyi and Guill found that the values of δ of the E51 resin were 11.78, 11.57, 11.48 and 11.14 MPa1/2 at 30, 40, 50 and 60 ° respectively. The dispersive component (δD) and the specific component (δSP) of solubility parameter at differ temperatures of the E51 resin were investigated according to the relationships between surface tension, coh energy and solubility parameter. The results showed that the values of δD were higher than those of δSP for resin, and both of them decreased with the increase of temperature.

Keywords： inverse gas chromatography (IGC) surface tension solubility parameter epoxy resin

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