

结构材料及核材料性能

β射线检测聚4-甲基-1-戊烯泡沫密度梯度

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摘要 低密度多孔材料的密度均匀性及其梯度对材料性能有极其重要的影响。现有检测技术不能满足物理实验的检测需求, 故新建一种β射线检测技术及相应软件, 用以对低密度多孔材料的密度分布进行高灵敏定量表征。本工作叙及该系统的装置、原理和方法, 通过对不同工艺制备的聚4-甲基-1-戊烯 (TPX) 泡沫进行测试, 给出了样品密度分布的2D、3D图及密度不均匀度的统计图, 并对不同样品泡沫进行对照, 可明显看出泡沫密度均匀性的差异。该技术不仅满足了测量要求的空间及密度分辨率, 还可实现轴向密度分布的无损检测以及径向密度分布测量。

关键词 [聚4-甲基-1-戊烯; 泡沫; 密度梯度; β射线检测](#)

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β-ray Detecting Technology for Density Gradient of Poly 4-methyl-1 pentene Foams

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Abstract The density uniformity and gradient of low density porous materials are important for its performance. β-ray detecting technology and software were constructed and used to determine the foam density uniformity with rations sensitively because existing detecting technology can not satisfy the demands of physics experiments. The systemic setting, principle and method were described. 2D and 3D graphs and statistic unevenness for the density distribution of samples were presented through detecting different technical poly [JP2]4-methyl-1-pentene (denoted as PMP or TPX) foams. Furthermore, comparing different samples, the difference of foams density uniformity was visible. The technology can not only satisfy the demands of spatial and density resolution but also achieve detecting density distribution of samples on radial and on axis non-damaging.

Key words [poly 4-methyl-1-pentene](#) [foam](#) [density gradient](#) [β-ray detecting](#)

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