

论文摘要

中国有色金属学报

ZHONGGUO YOUSEJINSHUXUEBAO XUEBAO

第17卷 第12期 (总第105期) 2007年12月

 [PDF全文下载]

文章编号: 1004-0609(2007)12-1943-05

不锈钢纤维多孔材料的吸声性能

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摘要: 采用不锈钢纤维为原料制备不同孔隙性能的纤维多孔材料, 采用驻波管法检测该纤维多孔材料的空气声吸收系数, 研究材料的孔隙度、纤维直径以及材料厚度等参数对吸声性能的影响, 同时研究在材料背后设置空气层以及空气层厚度对材料吸声性能的影响关系。结果表明: 实验采用的不锈钢纤维多孔材料具有较好的吸声性能, 材料的孔隙度越高、厚度越大、纤维越细, 材料的吸声性能越好, 在材料背后设置空气层可显著改善其低频吸声性能, 材料背后的空气层厚度越大, 材料的低频吸声性能越好。

关键字: 不锈钢纤维; 多孔材料; 吸声材料; 吸声系数

Sound absorbing properties of stainless steel fiber porous materials

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Abstract: The stainless steel fiber with different diameters was introduced to fabricate porous sound absorbing materials, whose sound absorption coefficient was measured by standing wave tube method. The effects of porosity, fiber diameter, and thickness of the fibrous porous materials on the sound absorption coefficient were investigated, and the sound absorbing performance of the fibrous materials with airspace on back with different thickness was also analyzed. The results show that the sound absorption coefficient increases with increasing porosity and thickness of fibrous materials. The airspace shows a great influence on the sound absorption coefficient at lower frequency, the thicker the airspace, the higher the sound absorption coefficient.

Key words: stainless steel fiber; porous materials; sound absorbing materials; sound absorbing coefficient

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