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## 基于电磁参数的多层电磁波屏蔽涂料研究

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Study on the multi-layer electromagnetic shielding paint based on electromagnetic parameters

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**摘要** 在分析改性碳纤维和镍粉的复介电常数和复磁导率的基础上,进行复合电磁屏蔽涂层结构的设计,以实现频率小于1.5GHz的电磁波屏蔽效能的提高.制备了改性碳纤维/丙烯酸酯类树脂和镍粉/丙烯酸酯类树脂的电磁屏蔽涂料.实验表明:对填料基本电磁参数的分析能优化多层屏蔽涂层的设计,依据电磁参数来调整各层屏蔽涂料所用填料,可实现逐层阻抗匹配和提高屏蔽效能.在频率小于1.5GHz的低频区域,多层屏蔽涂层的最大电磁屏蔽效能可达30.5dB,相对单层屏蔽涂层,提高了5.31dB.

**关键词:** 电磁屏蔽材料 复介电常数 复磁导率 电磁波屏蔽 改性碳纤维 镍粉

**Abstract:** The structure of multi-layer shielding materials was designed based on the analysis of fillers' complex permittivity and complex permeability, in order to improve shielding effectiveness in frequency less than 1.5GHz. The electromagnetic parameters of modified short carbon fiber and modified nickel were measured. The multi-layer shielding paints based on modified carbon fibers and nickels were prepared. The results showed that the analysis of fillers' electromagnetic parameter redounded to optimize multilayer design. Impedance matching and higher SE may be realized by adjusting fillers, using different layers, according to electromagnetic parameter. Compared with monolayer film, the SE<sub>max</sub> of multi-layer films, reached to 30.5dB, increased about 5.31 dB in frequency less than 1.5GHz.

**Key words:**

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