废旧涤纶织物复合材料的制备及性能研究

Preparation And Properties of Waste Polyester Fabric Composite

摘　　要

纺织产业自诞生起就在中国经济产业中占据了举足轻重的地位，可谓是国家的命脉产业，是国家增强国际竞争力、加快经济发展、促进对外贸易、缓解就业压力的最重要的产业之一。随着纺织产业的不断发展，未来全球纤维消费及人均消费量还将保持增长势头，这意味着将产生大量废旧纤维，目前为止多数废弃纺织产品只能被当作垃圾最终做填埋或焚烧处理，浪费资源的同时又破坏环境；而另一方面汽车产业、装修行业等其它行业产业随着发展资源和发展能源的消耗,同样在产生了大量废弃产品的同时造成了环境污染问题。在大量的废弃织物中，废弃涤纶织物占据了相当大的比重，工业上废旧涤纶织物主要采用水解、醇解等化学法进行处理，将废旧涤纶织物降解成单体或齐聚物，而后再经缩聚制成再生聚酯从而回收利用，其余存在利用废旧涤纶织物较高的含碳量制备活性炭的研究，也存在利用摩擦法或熔融法制备再生造粒，甚至有直接燃烧利用产生的热能的回收再利用方法。

根据现有的相关研究和市场需求，考虑回收利用的可行性和发展，进行了本课题的研究。在本文中主要以废弃涤纶织物为主要原料，设计切实可行的废旧涤纶织物复合材料的合成方案，并合理设计在绝大多数情况下复合材料所需要的拉伸断裂强度、弯曲强度、燃烧性能、吸音性能等的测试方案，最后对整体方案进行总结和分析。

关键字：纤维复合材料 废旧涤纶 环保 拉伸断裂强度 冲击强度 弯曲强度 吸水性能 燃烧性能 热稳定性 吸音性能

ABSTRACT

Textile industry has been playing an important role in China's economic industry since its birth. It can be said that it is the lifeblood industry of the country. It is one of the most important industries for the country to enhance international competitiveness, accelerate economic development, promote foreign trade and relieve employment pressure. With the continuous development of the textile industry, the global fiber consumption and per capita consumption will continue to grow in the future, which means that a large number of waste fibers will be produced. So far, most of the waste textile products can only be used as garbage for landfill or incineration, which wastes resources and damages the environment at the same time. On the other hand, other industries such as automobile industry, decoration industry are developing with the development of the industry The consumption of exhibition resources and development energy also causes a lot of waste products and environmental pollution. In a large number of waste fabrics, waste polyester fabrics account for a considerable proportion. In industry, waste polyester fabrics are mainly treated by chemical methods such as hydrolysis and alcoholysis, which degrade waste polyester fabrics into monomers or oligomers, After that, the recycled polyester is made by polycondensation, and then recycled. The other methods include the preparation of activated carbon with high carbon content of waste polyester fabric, the preparation of recycled granulation by friction method or melting method, and even the recovery and reuse of thermal energy generated by direct combustion.

According to the existing relevant research and market demand, considering the feasibility and development of recycling, the research of this topic is carried out. In this paper, waste polyester fabric is mainly used as the main raw material to design a feasible synthesis scheme of waste polyester fabric composite, and reasonably design the test scheme of tensile breaking strength, bending strength, combustion performance and sound absorption performance required by the composite in most cases. Finally, the overall scheme is summarized and analyzed.

KEYWORDS fiber composite material Waste polyester environmental protection Tensile Strength Impact Strength bending strength Water absorption combustion characteristics thermal stability sound absorption