



# 1 Graphene nanoribbon coated flexible and conductive cotton fabric

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5 **Abstract:** In the present study, the graphene nanoribbon was prepared and was coated  
6 to the cotton fabric using a wet coating approach. The prepared graphene nanoribbon  
7 coated cotton fabric was characterized in terms of morphological, thermal, mechanical  
8 and electrical properties. It was shown from the results that the graphene nanoribbons  
9 were uniformly distributed on the surface of the cotton fibers and interacted with the  
10 cotton fibers through hydrogen interactions. The graphene nanoribbon coating improved  
11 the thermal stability of the cotton fabric. Moreover, the mechanical properties of the  
12 cotton fabric improved significantly as well. Due to the incorporation of the rigid filler,  
13 the tensile stress and the Young's modulus increased by 58.9% and 64.1%, respectively.  
14 More significantly, the graphene nanoribbon coated cotton fabric was highly conductive.  
15 The resistance of the cotton fabric had a linear dependence on the strain of it when the  
16 applied strain was 20%. The prepared graphene nanoribbon coated cotton fabric has  
17 great application potentials in smart textile industry.

18 **Keywords:** A. Textile composites; A. Coating; B. Electrical properties; Graphene  
19 nanoribbon

## 20 1. Introduction

21 During the past decades, significant progress has been achieved in the area of  
22 technical textiles [1, 2]. Fibers, yarns, fabrics and other structures with added-value

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