graphs, we can see that the minimal value of electrical resistance is 1.25 kΩ/sq for 15.96% The CB particle concentration for the material coated with CB solution is 0.016 kΩ/sq for 16.88% CB particle concentration for the material coated with CB solution with SS yarns in the woven fabric. An increase in CB particle concentration up to these values does not cause a decrease in electrical resistivity.

Conclusions

The results show that both the fabric coated with carbon black and that coated with CB with SS yarns inserted have electrical conductivity.

The electrical properties of these conductive materials are influenced by different factors such as the carbon black concentration, and the insertion of conductive yarns in the fabric. The electrical resistivity (kΩ/sq) decreases in the interval [10.41, 15.96] increases in the interval [15.96, 16.88] for the textile material coated with CB solution only, and decrease in the interval [10.41, 16.88] for the textile material with SS yarns coated with CB solution. An increase in CB particle concentration from 10.41% to 15.96% causes a decrease in electrical resistivity from 10.5 kΩ/sq to 1.25 Ω/sq in the first case and from 0.28 kΩ/sq to 0.016 kΩ/sq in the second case (from 10.41% to 16.88% CB particle concentration). The results show the influence of CB particles and other components of the solution on resistivity and set conditions in order to obtain a minimal electrical resistivity, which causes an increase in the sample temperature. For a 15.96% concentration of carbon black particles on fabrics made from cotton yarns and for 16.88% concentration of carbon black particles on fabrics made from cotton yarns with SS yarns in the structure, the electrical resistivity was minimal. Taking into account the values of electrical resistance of the samples, one of the applications can be using them as detachable heating fabrics which can be embedded into clothing like jackets, gloves, etc. These heating elements can be removed in the process of washing, which can be an important factor regarding the stability of the electrical resistance; for keeping the elasticity and preventing the abrasion of the conductive layer, on top of which a protective layer from latex can be laid.

In the end, we can say that increasing the CB particle concentration causes a decrease in electrical resistivity; the concentration of the other components of the coating material have less of an influence on the electrical properties of the conductive fabric obtained.

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