Graphene Doping

Hall, Dylan
Harris, Devin

Abstract The process of doping can be described as introducing impurities into a pure material to alter its properties. In this study, we introduced iodine into a solution of graphene in various ratios and measured the electrical resistance of each sample, in their solid state, in hopes of lowering the electrical resistance of the graphene. Nine trials of doped graphene were each mixed with different ratios of graphene to iodine, from 101:1 graphene to iodine up to 109:9 graphene to iodine, while one trial was the control. These solutions were poured into separate containers to produce 10 graphene disks. Once the disks dried, a layer of polyurethane was applied to hold them together. The finished disks were removed from their containers and their electrical resistance was then measured with a multimeter. Each solution was prepared three times to ensure quality and precision. It was found that the relationship between the amount of iodine that the graphene was doped with and the electrical resistance of the graphene is parabolic. The iodine content in the graphene will decrease the electrical resistance to an extent, but increasing the amount of iodine after a point will begin to increase the resistance of the graphene.