

Study of acid modified MWCNT by reflux method

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Nanomaterials have been widely interested especially carbon nanotubes (CNT) since they show excellent combination of thermal, mechanical and electrical properties [1-2]. However, as-produced CNT are entangled due to their long length. Therefore, the dispersion efficiency of CNT is limited. In this research was focused on acid modification multiwall-CNT (A-MWCNT) by reflux method in order to decreasing the length and improving dispersion. MWCNT were modified with an acid mixture of sulfuric acid and nitric acid at the ratio of 3:1. The reflux temperature and time were studied at 80-120°C and 10-30 minutes. From FTIR results, it was found an increase in carboxylic acid groups on their surfaces as increasing reflux temperature and time. Therefore, A-MWCNT showed good dispersion in polar solvents; i.e. water, DMF and DMAc. Furthermore, the lengths of A-MWNCT were shortened as increasing reflux temperature and time. As the result of carboxylic acid group on A-MWCNT surfaces, it was found a decrease in the electrical conductivity at two magnitudes. However, epoxy incorporating with A-MWCNT modified at 120°C and 30 min showed better conductivity since the shortest MWCNT lengths were able to being good dispersion.

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References:

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