Ultrasonication of Graphene/Copper composites for Additive Manufacturing

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The development of nanotechnology combined with additive manufacturing has led to the rapid transformation of the electronics industry. The conversion of technology from analog to digital through microchips (computers, automotive/aerospace, electronics) comes with an inevitable problem which is heat dissipation due to the operation of electronics. It is estimated that the large centres use 40% of the total energy to solve this problem [1]. For this reason, there is an emergent need for new materials with high thermal conductivity to dissipate heat when used in electronic devices. Traditionally synthetic diamonds, and metal powders (such as copper) are characterized by high thermal conductivity, however, these materials have drawbacks such as high cost and scalability. 2D materials, such as Graphene and hBN with their extraordinary properties [2] seem the right candidates to address this problem. In this work, we present the preparation of graphene/copper composites through the ultrasonication process [3] suitable for additive manufacturing with their characterization via UV-Vis, TEM, XRD, and XPS.

References

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