# SYNTHESIZING ELECTRO- CONDUCTIVE GREASE USING GRAPHITE

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by

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# Abstract

Graphite as we all know is well renowned for its ability to conduct electricity as well as its lubricant nature. Graphite has a honey comb structured planes where carbon atoms are bound together by strong covalent bonds. And each of these layers of carbon is bound together by weak van der Waals bonds. Grease is a semi solid lubricant widely used in the industrial world to reduce ware and tare. Grease is made of three principal components known as a base oil, thickener and additives. Thus combining graphite with grease would preferably transfer the electro-conductive nature of graphite to grease forming an electro-conductive grease.

Usage of such a product would be, Grounding static discharges, provides electrical continuity between irregular or pitted surfaces, ensures electrical contact between loose or vibrating parts and small gaps, apply to ball bearings in computer equipment where it allows static discharge to pass through the bearing instead of building up, arcing, extending the Life of Rotating Switches, preventing Corrosion on Knife Switches, grounding Ball and Socket Connections on Power Insulators.

Natural vein graphite was used to make graphite powder under 75 microns. Basic grade grease was used as the substrate. Different weight ratios of both graphite and grease were mixed by blending to generate the sample series. The samples were tested for electrical conductivity using the impedance analyzer. A standard cell was made to hold the sample. The conducting length was kept to a minimum assuming that in real world applications (12 millimeters). Three measurements were taken with each generating a graph of imaginary part of impedance versus the real part of it. And the resistance of the sample was determined by the point where the curve seemed to make contact with the x axis of the graph.

The samples show a near linear variation of both characteristics of conductivity and capacity. But the final sample containing 35% graphite with 65% grease shows a significant elevation in both conductivity and capacity. With a conductivity value of $4.2008 \times 10^{-5}$ S $cm^{-1}$ this particular sample is in the region of semiconductors with respect to conductivity