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Tribological properties of introducing carbon nanoparticles produced by arc discharge in different paraffin oil grades

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A test apparatus with electronic control system was devised to synthesis Carbon Nanoparticles (CNP) by submerged arc discharge between two pure graphite electrodes in pure liquid paraffin oil medium. Different grades of oil viscosity are used. It was found that the resultant oil from the arc process contains carbon nanoparticles. Transmission Electron Microscope (TEM) was used to characterize the output morphology of the resultant CNP. Physical and tribological properties of the resultant oil are assessed. It was found that presence of CNP in paraffin oil resulted in reduced coefficient of friction in four-ball testing machine, raising its flash point, but reduced slightly its viscosity. This system can be improved to be applied industrially in a continuous product line with added suitable dispersant. Further work is proceeding to optimize test conditions.

Biography

Hesham M M El-Sherif holds his Bachelors in Mechanical Design and Production Engineering from Cairo University, July 2011. After graduation, he worked as a Teaching Assistant with the Mechanical Design Group at the Mechanical Design and Production Department (MDP). He finished his Pre-Master courses with GPA 3.8 out of 4.0. He pursued both his Bachelors and Masters in synthesis of nanomaterials by arc discharge technique and applying nanoparticles in tribological applications under the supervision of Prof. M. O. A. Mokhtar. His Master's thesis defense will be held on September 2014.

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