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[SEM-321] Synthesis and tribological study of graphene modified with MoS2 as additive in lubricating oils.

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The friction and attrition are the main causes of low efficiency in the machines which constitute approximately 30% energy loss consumed globally. To lessen these effects were been used different types of oil-based lubricants with additives that included molybdenum disulfide (MoS2) and graphite, which improve the lubricating properties of the oils. In this research, graphene oxide (GO) was synthesized with different oxidation degrees using the modified method Hummers. The GO was chemically decorated with molybdenum disulfide using sodium molybdate and thiourea as precursors of molybdenum (Mo) and sulfur (S), respectively. The GO powders prepared were tried using a reducing sugar to compare the structure and the tribological properties of GO, reduced GO and MoS2-GO.For recognize the crystalline structure were realized X-ray diffraction analysis, where was found a signal between 10 and 11° related to the plane (002) of the laminar structure of GO. For studying the molecular structure was used infrared spectroscopy for Fourier transform, where was observed the oxygenated groups that been presented in the GO sheet, also the microstructure was determined by Raman spectroscopy. To study the effect of these materials as additives of lubricating oils, dispersions of them were prepared in a oil-based lubricating and were characterized in a ball on disk tribometer, where the friction coefficient is reduced using the GO/MoS2 as additive compared to the other powders used. The attrition surfaces of the discs used in the tribological tests were studied by scanning electron microscopy for determining the lubricating ability of each formulation over the oils. Projects financed by SIP20140293 and SIP 20144607.