

Abstract Submitted
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Synthesis of MoS₂ Flakes by Electrical Arc Discharge of Molybdenum Wire and sulfidization of MoO₃¹ VICENTE GONZALES, JOHN SANCHEZ, JESUS VELAZQUEZ-SALAZAR, MIGUEL YACAMAN, University of Texas at Santonio, UTSA DEPARTMENT OF PHYSICS AND ASTRONOMY COLLABORATION — Molybdenum Disulfide (MoS₂) is an important inorganic compound in industry due to its robustness, ability to withstand high temperatures, and physical properties. It acts a solid lubricant in oils as well as functioning as an excellent co-catalyst in desulfurization for uses in petroleum refining. In this project, we used electrical arc discharge to first synthesize Molybdenum Trioxide (MoO₃), then sulfidized the MoO₃ at 800°C to form our MoS₂ flakes. We then used a scanning transmission electron microscope (Hitachi 5500) to analyze the structure of our MoS₂ flakes and perform a chemical analysis. Electrical arc discharge is an innovative and favorable synthesis method due to the simplicity of the setup, and the large volume of particles produced. We varied parameters such as the voltage and amperage in our electrical arc discharge process to maximize the amount of MoO₃ produced; thereby increasing the amount of MoS₂ we could produce. Characterizations were done to ensure that the Molybdenum Disulfide was of correct structure (flakes) and to ensure that these flakes were of correct chemical composition. Future applications in industry of these particles directly depend on the ability for us to produce these particles in the correct shape (flakes) and the efficiency by which we can produce them.

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