

Characterization of Molybdenum Trioxide Powder for a SHS Process

**R. Caro¹, C. Castro², S. Lagos³, J. Lisboa³, A. Meléndez², J. Nanjarí⁴, J. Pérez²,
J. Rivera⁵**

¹**Fábricas y Maestranzas del Ejército de Chile, Av. Manuel Rodríguez 02, Talagante, Chile**

²**Academia Politécnica Militar, Valenzuela Llanos 623, Santiago, Chile,**

³**Comisión Chilena de Energía Nuclear, Amunátegui 95, Santiago, Chile,**

⁴**Instituto de Investigaciones y Control del Ejército, Av. Pedro Montt 2120, Santiago, Chile**

⁵**Pontificia Universidad Católica de Chile, Av. Vicuña Mackenna 4860, Santiago, Chile**

ABSTRACT

The self-propagating high-temperature synthesis process has been widely and carefully studied for many combustion reactions with different compounds as raw materials; however, for the MoO₃-Al reaction there are not many reports and the properties of MoO₃ as a reactant are not clear. Then, for a better understanding of the physicochemical properties of MoO₃, laboratory and theoretical studies have been developed. Differential thermal analysis tests were performed to establish the physical response against thermal changes as well as a dynamic recrystallization test to verify what compounds were present. A particle size test was performed to establish the granulometry and agglomeration condition before combustion reaction takes place plus Gibbs's free energy analysis in order to understand the phase changes. The result showed that the purity, granulometry, and condition of the powder mix were appropriate for the combustion reaction.