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YUCOMAT 2018

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Synthesis of tribological WS_2 powder from oxide precursor

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This paper describes two stages process for synthesis of WS_2 powder on selected temperatures by using WO_3 as a precursor. WO_3 submicron particles were prepared by ultrasonic spray pyrolysis of ammonium meta-tungstate (AMT) at 650°C in the air. WS_2 particles were obtained by sulfurization of the WO_3 particles in presence of additive K_2CO_3 in a nitrogen atmosphere, first at lower temperature (200°C) and followed by reduction at higher temperature (900°C). HSC Chemistry software package 9.0 is used for the analysis of chemistry and thermodynamic parameters of the processes for synthesis of WS_2 powder. The samples of WO_3 and WS_2 powders were characterized by X-ray diffraction (XRD) measurements. The morphology and composition of these samples were examined by scanning electron microscopy (SEM) combined with energy dispersive X-ray analysis (EDX).
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