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## Insights of the hydrothermal synthesis of scheelite-structured powders in the SrMoO<sub>4</sub>-SrWO<sub>4</sub> system: Structure and luminescence characterization

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The present experimental work relates to a study of the hydrothermal powder processing of a functional luminescence compound. Strontium molybdate, strontium tungstate and their solid solutions were successfully prepared under hydrothermal conditions. The soft chemical method studied comprises the usage of SrSO<sub>4</sub> (celestite) ore as the precursor of Sr. Particle crystallisation occurred rapidly because of a single step reaction, which was promoted using a highly concentrated alkaline media (5 M NaOH solution) at a temperature below 200°C for 2 h under vigorous stirring at 130 rpm. In all the cases investigated, the particle crystallisation took place without the formation of secondary phases, while the ionic species representing impurities in the precursor mineral remained dissolved in the alkaline fluid. Differences in the morphology of the particles were observed when the W content varied from 25 mol% and 75 mol%. Additionally, the mechanism associated with the reaction and precipitation process investigated is discussed in detail, together with a crystalline structural characterization. Photoluminescence analyses indicate that blue and green emission responses and its intensity can be attenuated when incorporating W contents between 10 mol% and 60 mol%. Structural analysis conducted by Rietveld refinement and FT-Raman methods indicated that a localized distortion of the MO<sub>4</sub> tetrahedral site of the scheelite structure is produced by the disordering of the Mo and W ions resulting in the blue and green emission attenuation. Hence, these present results indicate the intermediate SrMo<sub>1-x</sub>W<sub>x</sub>O<sub>4</sub> particles have a potential to operate as a phosphorous-like light emitting material.

### Biography

Juan Carlos Rendón-Angeles has received his degree of PhD in Engineering from the Faculty of Mechanical Engineering, Tohoku University Japan (1997). His early career holding a Postdoctoral position (1997-2000) at the Research Laboratory of Hydrothermal Chemistry enabled him to study the basic fundamental chemistry of the mechanisms related to hydrothermal reactions. He has joined the Department of Ceramic Engineering at CINVESTAV Saltillo Campus in 2000 and was promoted to Associate Professor in 2009-at present. He has published more than 50 papers in reputed journals and has been serving as an Reviewer of reputed journals.

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