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# Change of the properties of nanostructured MoO<sub>3</sub> thin films using gamma-ray irradiation

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## Abstract

Thin films of Molybdenum trioxide (MoO<sub>3</sub>) were deposited on glass substrates by the spray pyrolysis at 500 °C and the samples were then exposed to gamma  $\gamma$  radiation doses by <sup>60</sup>Co radioisotope at different doses (0.1, 10 and 50 kGy). The effects of gamma irradiation on the properties of MoO<sub>3</sub> thin films were investigated. The XRD pattern and Raman spectroscopy of as-deposited MoO<sub>3</sub> samples show an orthorhombic structure related to  $\alpha$ -MoO<sub>3</sub> with (0k0) preferred orientations. Uv-vis spectra were studied to investigate the transmission measurements of MoO<sub>3</sub> films. The optical energy band gap and Urbach energy were found to be gamma-dose dependent. Photoluminescence measurements at room temperature using 300 nm wavelength excitation were investigated. SEM images indicate the formation of  $\alpha$ -MoO<sub>3</sub> nanorods.

**Keywords:** MoO<sub>3</sub> Oxide; Thin film deposition; Spray Pyrolysis; Gamma Irradiation

## 1. Introduction

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