

# CO-sensing properties of hafnium oxide thin films prepared by electron beam evaporation

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## Abstract

Thin films of hafnium oxide were deposited by electron beam evaporation. The effects of the film thickness and preparation conditions (films prepared on the heated substrate with or without the presence of oxygen environment during deposition) on the optical and carbon monoxide sensing properties of the films were studied. The films were characterized using X-ray diffraction and X-ray photoelectron spectroscopy and optical spectroscopy techniques. Films deposited on unheated substrates were amorphous, whereas those deposited on heated substrates showed a mixture of amorphous and polycrystalline structure. It was found that the sensitivity of the films to CO increased with the thickness and the porosity (as reflected by the refractive indices) of the films.

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*Keywords:* Thin film; Carbon monoxide sensor; Hafnium oxide; Semiconductor sensor