

# TIN OXIDE-PORPHYRIN STRUCTURES AS OPTICAL SENSORS FOR BIO COMPOUNDS DETECTION.

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Tin oxide is well known material for sensor application. Tin dioxide sensitive properties were studied by many authors. In spite of good sensitivity to different compounds it has low selectivity, which was compensated by varying of operation temperature or using metal dopants.

Porphyryns are often used for optical sensor applications [1]. It was reported that adsorption of molecules on porphyrin structures changed absorption spectra in visible light [1]. Absorption maximum position shift was observed under gas molecules adsorption [1].

2-Mercaptoethanol is organic liquid used in some biological applications. 2-Mercaptoethanol is considered a toxin, causing irritation to the nasal passageways and respiratory tract upon inhalation and irritation to the skin.

In the present work, tin oxide-porphyrin structures deposited on glass substrates have been investigated for 2-Mercaptoethanol detection. Tin oxide layer was deposited by electro-spray pyrolysis. Porphyrin layers were grown by dipping the substrates into porphyrin solution in water and toluene. Structural properties were characterized by XRD and AFM methods. Optical transmittance in range of 200-1100 nm and current-voltage (I-V) characterization of the structures were performed before and after adsorption of 2-Mercaptoethanol on their surfaces. Optical and electrical responses of the structures to 2-Mercaptoethanol at room temperature are reported. The influence of 2-Mercaptoethanol adsorption to I-V mechanism and optical transmittance was discussed.

[1] A. Dunbar, T.H. Richardson, A.J. McNaughton, W. Barford, J. Hutchinson, C.A. Hunter, Understanding the interactions of porphyrin LB films with NO<sub>2</sub>, *Colloids and Surfaces A: Physicochem. Eng. Aspects*, 284–285, **339–344** (2006)