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## CNT-Ni-Pd nanocomposite films for optical gas sensor

E.Czerwosz<sup>1\*</sup>, E.Kowalska<sup>1</sup>, M.Kozłowski<sup>1</sup>, J.Radomska<sup>1</sup>, H.Wronka<sup>1</sup>, M. Angiola<sup>3</sup>, A. Martucci<sup>3</sup>, W.Włodarski<sup>2</sup>

*1*Department of Nanotechnology, Tele&Radio Research Institute, Warsaw, Poland  
*2* School of Electrical and Computer System Eng., RMIT University, Melbourne, Australia  
*3*Department of Industrial Engineering, University of Padova, Padova, Italy

### Abstract

We present the optical properties of the nanocomposite nickel - carbonaceous (Ni-C) and carbon nanotubes, palladium-fullerene (CNT- Ni-Pd) films obtained by various methods. The initial film was prepared by physical vapor deposition (PVD) method using two separated sources: fullerene C<sub>60</sub> (as carbon source) and nickel acetate (as metal source). Next, the initial film was modified by chemical vapor deposition (CVD) using xylene at temperature ~ 650°C, as a result carbon nanotubes containing inside Ni grains were synthesized. Then, on the carbon nanotubes, palladium-fullerene films were deposited using PVD process, these samples were named by us as (CNT- Ni-Pd) films. All (Ni-C) films and (CNT-Ni-Pd) films were studied by SEM. These nanostructures were analyzed by optical method using measuring the variation of the absorbance of different gases (H<sub>2</sub>, CO, NO<sub>2</sub>).

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### 1. Introduction

Recently, carbon nanotubes (CNTs) due to their unique properties are applied as chemical sensors, biosensors and hydrogen storing materials. Their highly developed surface, many dangling bond and defects make CNTs an ideal

\* Corresponding author. Tel.: +48 22 8316746; fax: +48 22 8319231.  
E-mail address: [elzbieta.czerwosz@itr.org.pl](mailto:elzbieta.czerwosz@itr.org.pl)