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## 12. PROPERTIES OF CONTACTS AND WIRE BONDING FOR NEW GENERATION OF HYDROGEN AND HYDROGEN COMPOUNDS SENSOR

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Films containing palladium can be applied in hydrogen and hydrogen compounds sensors. The size of palladium grains and their distribution on the film surface affects the sensitivity of such film, and their ability of hydrogen dissolution in palladium.

The nC-Pd film was prepared in the following way: first physical vapor deposition (PVD) process was applied to obtain nanocomposite carbonaceous film (NC film) with palladium nanocrystals dispersed in all the volume of film, then chemical vapor deposition (CVD) method in assistance of xylene and argon at the temperature 650°C was used for obtaining nC-Pd film. Finally, nickel (Ti), titanium (Ti) and nickel/titanium (Ni/Ti) metal films were deposited on nC-Pd layer using the electron beam bombardment vacuum evaporation method.

The main aim of this work was to prepare a suitable wire bonding technology. In case of electrical contacts to sensitive layer, the effects of metal deposition process' parameters, like electron beam current, target-substrate distance and evaporation time on the film thickness were studied. Electrical properties of deposited films were analyzed. The effects of annealing temperature on resistivity were studied. Possible contaminations were checked by using secondary ion mass spectrometry (SIMS). Properties of wire bonding to deposited films of nickel, titanium, nickel/titanium were analyzed.

### 1. INTRODUCTION

Palladium (Pd) is frequently used in sensor technology, especially in detection of hydrogen. It should be noticed that this material is rather expensive, and its price is continuously rising. As far as PVD methods are concerned, the amount of material actually used is disproportionally small to the amount of material consumed in the process of applying. As an alternative, palladium compound can be used as its