

## Synthesis of Doped Nanosized tin (IV) Oxide by Sol-Gel Method

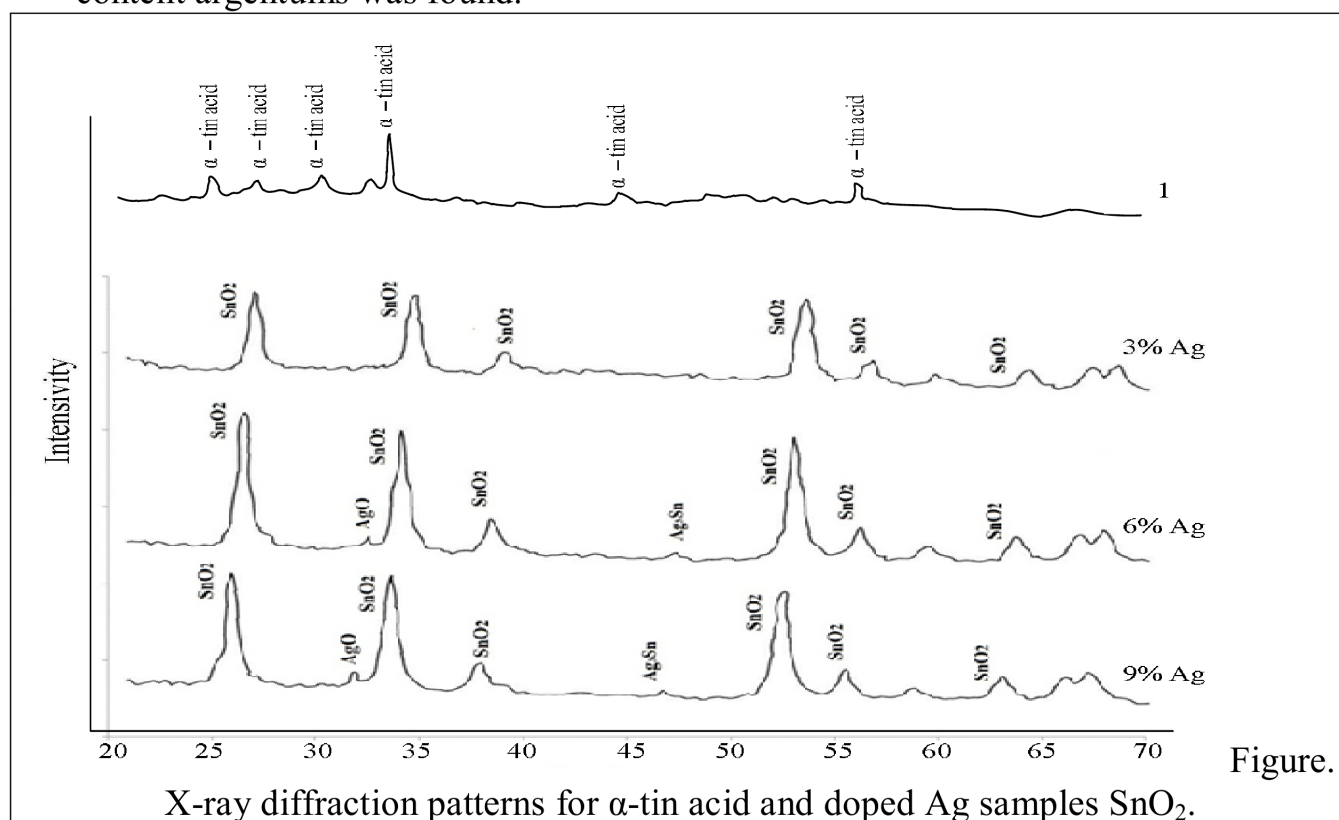
Yarotskiy O.M., Ivanenko I.M., Dontsova T.A.

*National Technical University of Ukraine «KPI», Kyiv, Ukraine*

It is known that the stability, sensitivity, selectivity and response time gas sensors can be significantly improved by not only reducing of the particles size  $\text{SnO}_2$  to nanometer but also adding doping agents. Sol-gel method is one common technique of synthesis of the smallest powders, whose effectiveness was assessed by crystallite size and specific surface area of the synthesized samples.

Tin(IV) oxide doped Ag was synthesized in this work. For this purpose to intermediate product of sol-gel synthesis –  $\alpha$ -tin acid (Fig. curve 1) was added 20% solution of argentum (I) nitrate, which volume depends on the required calculated Ag content in the final  $\text{SnO}_2$ .

X-ray diffraction patterns for three synthesized samples with argentum 3, 6 and 9 mol. % present in Fig. The presence of crystalline  $\text{SnO}_2$  cassiterite type, as well as significant peaks  $\text{Ag}_3\text{Sn}$  and  $\text{AgO}$  with intensity proportional to the content argentums was found.



Lattice parameters of pure and doped  $\text{SnO}_2$  are  $10 \times 9 \times 10$  nm. The surface area of synthesized  $\text{SnO}_2$  powders as a result of doping increases from 100 to  $180 \text{ m}^2/\text{g}$ .