

# "Physico-Chemical nanomaterials science"

## Atomic-deficient nanostructurization in water-sorption ceramics

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Electron interaction with its antiparticle (positron) in lifetime-measuring mode is known to be an effective tool to study nanostructurization in solids possessing mixed positron ( $e^+$ ) and positronium (Ps) trapping [1]. Intrinsic inhomogeneities due to guest nanoparticles embedded in some substances can be adequately described in terms of substitution trapping in  $e^+$ - and Ps-related sites within the same homogeneous host matrix, allowing parameterization of interfacial free-volume voids responsible for positron trapping and defect-free bulk lifetimes of nanostructurised matrix [1,2].

In this report, this model is considered in details for the case of free-volume nanostructurization caused by absorbed water in some glasses and ceramics, exemplified by  $\text{GeS}_2\text{-Ga}_2\text{S}_3\text{-CsCl}$  chalcogenides and  $\text{MgAl}_2\text{O}_4$  spinels.

1. Shpotyuk O., Filipecki J., Ingram A., Golovchak R., Vakiv M., Klym H., Balitska V., Shpotyuk M., Kozdras A. Positronics of subnanometer atomistic imperfections in solids as high-informative structure characterization tool // *Nanoscale Res Letters*-2015.-**10**.-P. 77-1-77-5.
2. Shpotyuk O., Ingram A., Filipecki J., Bujňáková Z., Baláž P. Positron annihilation lifetime study of atomic imperfections in nanostructurized solids: On the parameterized trapping in wet-milled arsenic sulfides  $\text{As}_4\text{S}_4$  // *Phys Stat Sol B*.-2016.-**6**.-P. 1054-1059.