ZnO tetrapod nucleation: a model based on magic clusters

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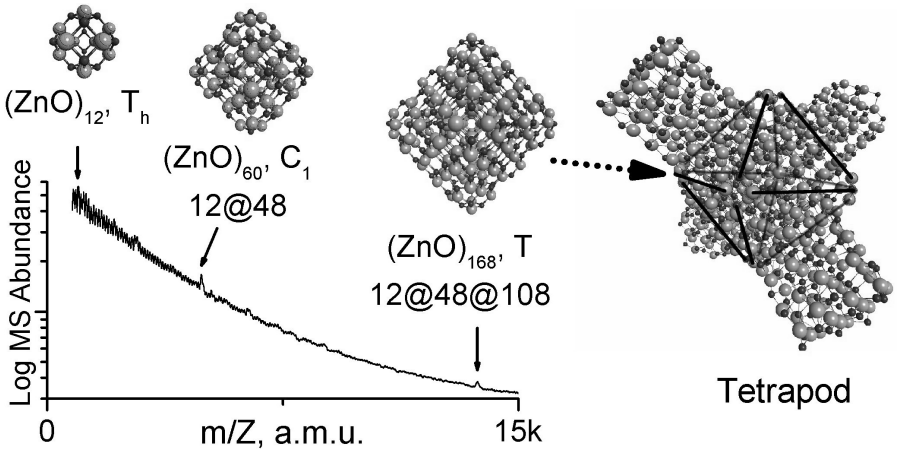
ZnO tetrapod-like nanostructures, known since 1944, have been suggested for many applications in optoelectronics, photovoltaics, catalysis, *etc*. There are many routes to produce the tetrapods in mass quantity: they are easy and cheap. There are several models of tetrapod nucleation, which, however, contradict each other: they suggest different structures for the nuclei.

In this report we explain our model based on mass spectroscopic results. $(ZnO)_{60}$ and $(ZnO)_{168}$ clusters are supereminent in the mass spectra of pulsed laser ablation of zinc peroxide: they have an enhanced abundance compare to the others; so they are called "magic clusters". We have developed a structural motif of the nested T_h symmetric shells of $(ZnO)_{12n^2}$, which perfectly describes the experimental findings. *Ab initio* calculations reveal symmetry reduction of the nested shell clusters, that paves the way to the tetrapod nucleation [1].



1. *A. Dmytruk, I. Dmitruk, Y. Shynkarenko, R. Belosludov, A. Kasuya.* Zinc oxide nested shell magic clusters as tetrapod nuclei // RSC Adv.-2017.-**7**.-P. 21933-21942.