

Synthesis of nano-ZnO with use of Mettler Toledo reactor at Laboratory of Nanostructures for Photonic and Nanomedicine CePT

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The aim of the study was the synthesis of nano-ZnO with use of Mettler Toledo reactor and the characteristics of the obtained product.

Mettler Toledo OptiMax reactor was purchased for the purpose of CePT project. The use of the reactor allowed to obtain nano-ZnO, with the expected properties.



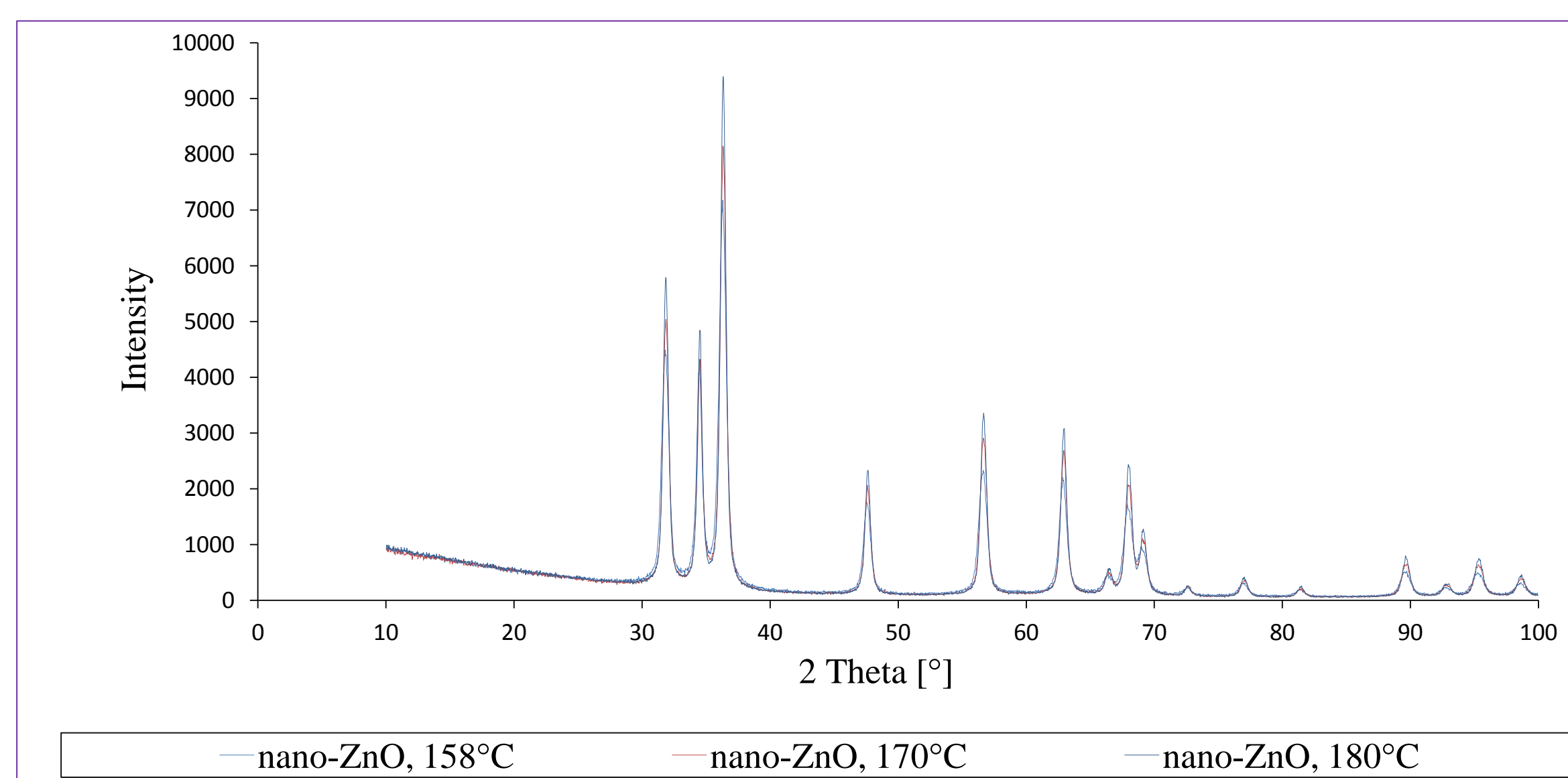
Mettler Toledo reactor allows to:

- precisely control the chemical processes
- carefully develop chemical processes and reactions
- monitor each step of the synthesis, which provides a lot of valuable information
- run synthesis safely
- carry out chemical reactions and processes under replicable conditions

Synthesis using the reactor allowed:

- obtaining nano-ZnO with desired physical and chemical properties
- synthesising nano-ZnO at a temperature of about 160°C
- observation of an intermediate product of nano-ZnO synthesis
- obtaining information about each step of the synthesis

X-ray analysis

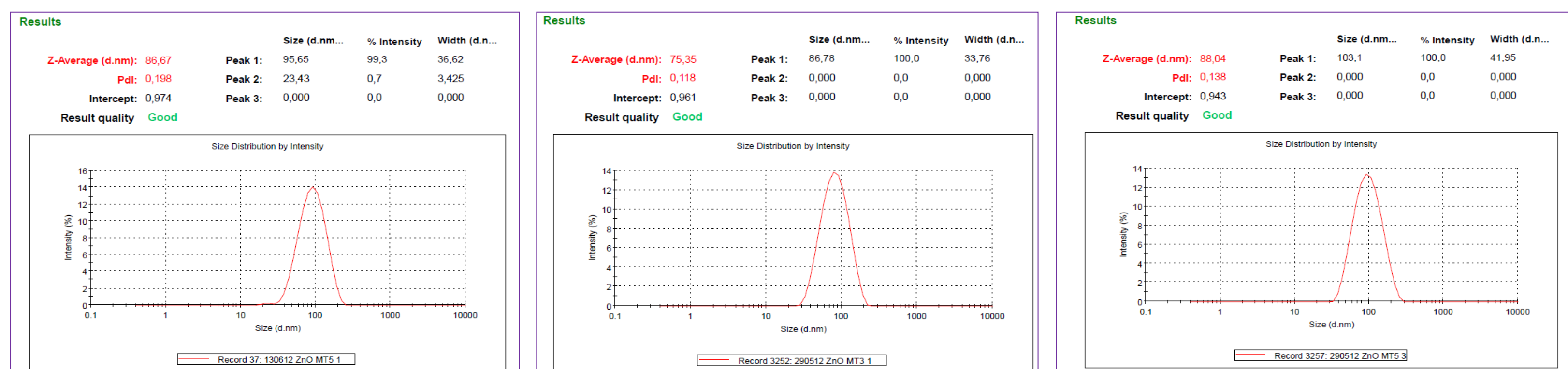


X-ray diffraction results of the obtained nano-ZnO. It is possible to obtain nano-ZnO at a temperature of about 160°C. The analysis confirmed the expected properties of nano-ZnO. Nano zinc oxide is a pure phase.

Phase composition of the obtained ZnO nanopowder was examined using X-ray diffractometer (PANalytical model X'Pert PRO).



Agglomerate-size measured by DLS Analyzer (Malvern Zetasizer-ZS model)



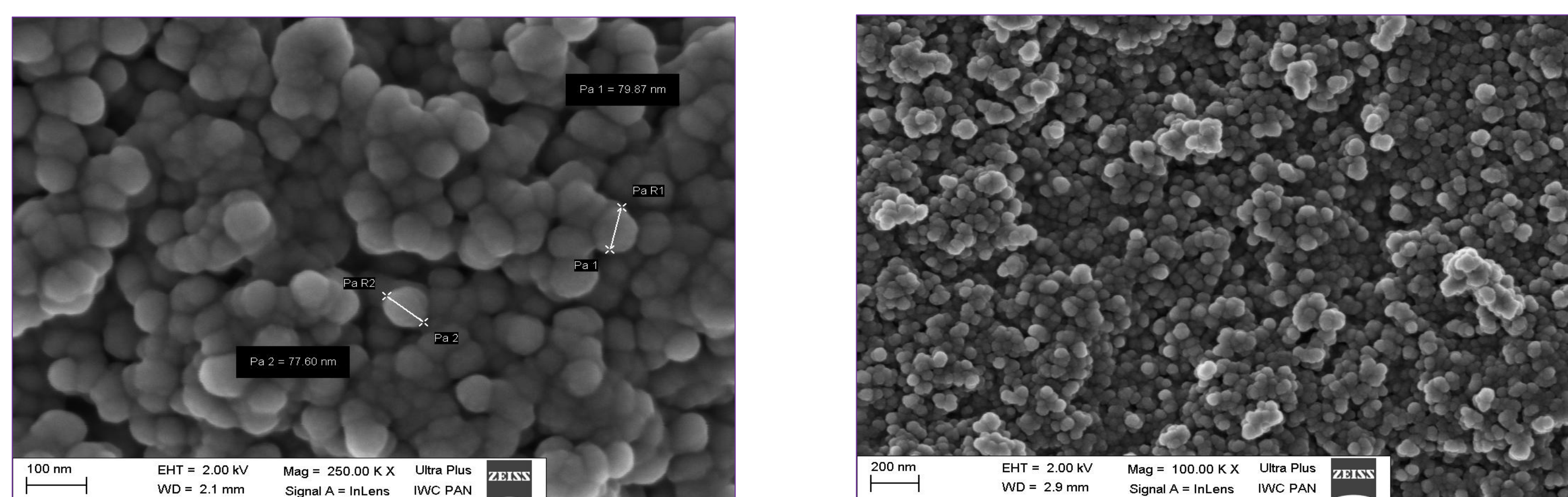
The size distribution of the agglomerates to the aqueous suspension of nano-ZnO is about 80 nm.

Agglomerate size as measured by DLS analyzer (Malvern, model Zetasizer-ZS).



Visualization of the obtained nanopowder using a Scanning Electron Microscope, model (Zeiss Ultra Plus)

SEM image of ZnO nanopowder. Agglomerate size of about 80 nm.



SEM was purchased for the purpose of CePT project. Scanning Electron Microscopy (Zeiss Ultra Plus) was used to examine the surface of prepared ZnO nanopowder.

