ZnO is a simple compound, which shows different textural and morphological characteristics according its synthesis route. These changes lead to the expansion of its applications in electronic and photonic industry due to the wide range of technological applications in devices including sensors, light-emitting diodes, laser diodes, solar energy conversion, catalysts, solar cells, varistor, etc. Some studies are related with applications in nuclear medicine area. When ZnO sintered pellets are irradiated in a cyclotron, it is possible produced the radionuclides 66Ga, 67Ga and 68Ga, which are widely used for diagnosis of diseases. In this work, ZnO nanoparticulate was obtained by reaction between aqueous solution of Zn(CH₃COO)₂ with NH₄OH, whose precipitate obtained was washed with distilled water to remove impurities, and centrifuged at 3000 rpm for 20 minutes. After that, the material was dried using various drying routes: controlled drying in oven, freezing drying and spray drying, and calcined at 800 °C for 2 h. The powders were pressed into pellet form and sintered at 1200 °C for 2 hours. With the use of different drying methods, the formation of the ZnO occurs at different stages and it was observed different morphologies and specific surface areas for the samples. The figures show the morphology of the samples heated at 800°C. The sintering mechanism was different for each sample. Some of the tablets were successfully used in the production of Ga radioisotopes by irradiation.

Acknowledgement: CNPq, FAPEMIG, CAPES and Centre of Microscopy of UFMG
Fig. 1: SEM image of the ZnO powders dried by controlled temperature and heated at 800°C.

Fig. 2: SEM image of the ZnO powders dried by freezing drying temperature and heated at 800°C.

Fig. 3: SEM image of the ZnO powders dried by spray drying and heated at 800°C.