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## STRUCTURAL AND MICROSTRUCTURAL ANALYSIS OF LUMINESCENT Tb:KY<sub>3</sub>F<sub>10</sub> NANOSPHERES USING X-RAY SYNCHROTRON DIFFRACTION

R. U. Ichikawa<sup>a\*</sup>, H. M. S. M. D. Linhares<sup>b</sup>, I. M. Ranieri<sup>b</sup>, X. Turrillas<sup>c</sup>,  
L. G. Martinez<sup>a</sup>

<sup>a</sup>Nuclear and Energy Research Institute, Materials Science and Technology  
Center, São Paulo, Brazil (IPEN/CNEN), \**ichikawa@usp.br*

<sup>b</sup>Nuclear and Energy Research Institute, Center for Laser and Applications,  
São Paulo, Brazil (IPEN/CNEN).

<sup>c</sup>Institute of Materials Science of Barcelona, Department of Crystallography,  
Bellaterra, Spain (ICMAB/CSIC).

Nanospheres materials have been intensively studied recently, due to their potential applications in several novel devices. One of these applications lies in their use in high-dose dosimetry. Particularly, nanostructured KY<sub>3</sub>F<sub>10</sub> re-doped with Tb has shown satisfactory results to be used in this area [1]. In the present work, the structure and microstructure of two samples of Tb:KY<sub>3</sub>F<sub>10</sub> was investigated by means of X-ray synchrotron diffraction. One of the samples was thermally treated and the other one was analyzed as-cast. Rietveld refinement was applied to obtain cell parameters, atomic positions and atomic displacement factors to be compared with the ones found in literature. Warren-Averbach and Pawley methods were applied to determine the mean crystallite size and its crystallite size distribution. The structural results showed that there are no significant structural changes but the microstructure was significantly changed when the thermal treatment was performed, inducing an inhomogeneous growth of the crystallites.

### References

[1] H. M. S. M. D. Linhares, Ph.D. Thesis, IPEN/CNEN, 2014.