

## **Development of organic scintillators for neutron detection**

J.L.A. Azevedo<sup>1</sup>, H.C. de Sousa<sup>2</sup>, A.M.A. Dias<sup>2</sup>, J.A. Mir<sup>3</sup>, J.M.F. dos Santos<sup>1</sup>, C.M.B. Monteiro<sup>1</sup>, F.D. Amaro<sup>1</sup>.

<sup>1</sup>LIBPhys, Physics Department, University of Coimbra, P-3004-516 Coimbra, Portugal.

<sup>2</sup> University of Coimbra, CIEPQPF, Department of Chemical Engineering, Rua Sílvio Lima, Polo II-Pinhal de Marrocos, 3030-790, Coimbra, Portugal

<sup>3</sup>University of Michigan - Ann Arbor, Department of Nuclear Engineering and Radiological Sciences, Ann Arbor, Michigan, United States of America

The detection of ionizing radiation is of vital importance in various branches of science, medicine, border security and environmental monitoring, among others. The development of new detection systems that have versatility of applications, of easy production and manipulation with viable costs has been one of the fields of application of many recent studies, namely in the field of neutron detection, since the main system to detect these particles is still based on helium 3, which is scarcely available, and its availability has progressively been decreased over time. Liquid and plastic scintillators are a viable alternative, as they are relatively easy to produce and can be produced in large sizes and formats. This work presents the study and development of different systems of organic scintillators with application in the detection of fast and thermal neutrons. Exploring different compositions for scintillators (plastic and liquid), making use of different compounds containing Boron or Lithium, incorporated into the scintillator matrix in a homogeneous and heterogeneous way is the aim of this work. Some preliminary results of this development are presented.