*Title:* **Optimization of plastic scintillation microspheres preparation**

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The use of ionizing radiation is founded in several fields as energy production, medicine, environmental protection... In spite of the benefits of the uses of the radioactivity, the radioactivity implies dangers for health and the environment. For this reason, it is important to find good methods to determine radiation. Liquid scintillation (LS) is one of the techniques that is used for this purpose. LS has very good detection efficiencies, even for low energy beta particles. LS is very well-known and sample preparation is easy. However, the generation of waste is a great issue for this procedure.

Plastic scintillation microspheres (PSm), produced by the evaporation/extraction method, appear as a good alternative to LS since PSm do not produce mixed waste. This is because microspheres are formed by polymerized material which possesses low reactivity. However, PSm are not completely available in the market due to its high cost and a limited range of sizes and compositions.

The following work focused on the optimization of the evaporation/extraction process in order to increase the amount of material produced in each preparation and decrease the cost without the analytical qualities being modified.

To achieve the optimization of the method mentioned above, the evaluation of the different experimental variables of production and the characterization of PSm obtained is carried out. In addition, the corresponding characterization from the morphological point of view (SEM and particle size) and radiometric (detection efficiency) is performed.

**Keywords**: Plastic scintillation microspheres, optimization, radioactivity, extraction, polymer.

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