

Title: **Preparation of fluorescent polymeric microparticles based on 9-vinylcarbazole**

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Plastic scintillation technique is a method for determining mainly beta emitting radionuclides, but also alpha, which has some advantages over liquid scintillation, the most commonly used technique. Some of the main advantages of plastic scintillation is that it avoids the generation of mixed waste and offers the possibility of a selective radionuclide determination in a complex sample using a selective extractant (PSresin).

Plastic scintillation measurements are based on the preparation of polymer microspheres that contain fluorescent molecules (PSm). The synthesis of PSresin requires, in some cases, the creation of covalent bonds between the extractant and the microspheres. Sometimes, during the synthesis of this type of PSresin, the fluorescent molecules are solubilized and lost.

In this work, it has been studied the possibility of using a polymerizable fluorescent molecule, 9-vinylcarbazole, which may enable doing the scintillation measurements with no specific fluorescent molecules. Because of this, poly(9-vinylcarbazole) has been synthesized and its scintillation capabilities have been evaluated as: whole scintillator system, mixed with polystyrene and copolymerized also with polystyrene.

The results conclude that PSm of copolymer synthesized from styrene and 9-vinylcarbazole (90:10) are the ones that offer the most promising results reaching a detection efficiency values of 30% for ^{14}C , 155% for ^{90}Sr / ^{90}Y and 84% for ^{241}Am .