

Title: **Bibliographic study of UV polymerization for the preparation of kits of Plastic Scintillator.**

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It has been reported that in the next few years, several nuclear power plants will be closed and will need a decommissioning process to characterize their residues. As a result, interest is increasing around the obtention of plastic scintillators capable of selectively detect alpha and beta radionuclides.

According to the need, in recent years, the QUESTRAM research group has been using thermal polymerization to develop polystyrene plastic scintillation kits for the detection of alpha and beta emitters with positive results.

The main objective of this project was to contribute to the preparation of plastic scintillator kits via a bibliographic study of photopolymerization with UV light to see if the results previously obtained could be optimized even more.

In comparison to thermal polymerization, UV polymerization is reported to be cheaper, faster and less polluting to the environment. Limitations to the thickness of the sample are reported due to low penetration of UV light in the samples. However, 3D printing technology can be used to synthesize samples with more complicated shapes.

Regarding the UV polymerization of styrene, disadvantages arise in comparison to thermal polymerization due to its susceptibility to UV light, which produces quenching due to yellowing and degradation of its structure.

Finally, plastic scintillators with a composition based on acrylates have been found to give scintillation efficiencies up to an 87% in comparison to commercial thermally produced plastic scintillators.

Keywords: UV polymerization, polystyrene, plastic scintillation.