



Tailoring Polysiloxane Matrices in Plastic Scintillators for Efficient Light Output and Pulse Shape Discrimination

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Abstract:

Plastics have found use as scintillators due to their relative ease of fabrication and ability to distinguish gamma and neutron response through pulse shape discrimination. A renewed interest in applying polysiloxanes as a matrix material in these scintillators has recently shown that competitive pulse shape discrimination (PSD) and light yield can be achieved using lower dopant loadings (5 wt% or less) in commercially available polysiloxanes (versus > 20wt% in polyvinyltoluene).¹ Current efforts have been directed towards synthesizing siloxanes tailored specifically for radiation detection. Through a collaborative cycle of design, synthesis and measurement, advancements have been made towards identifying and optimizing phenyl content in polysiloxane scintillators for efficient light output and PSD.

(1) Lim, A.; Arrue, J.; Rose, P. B.; Sellinger, A.; Erickson, A. Polysiloxane Scintillators for Efficient Neutron and Gamma-Ray Pulse Shape Discrimination. *ACS Appl. Polym. Mater.* **2020**. <https://doi.org/10.1021/acsapm.0c00641>.