Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supplementary Information

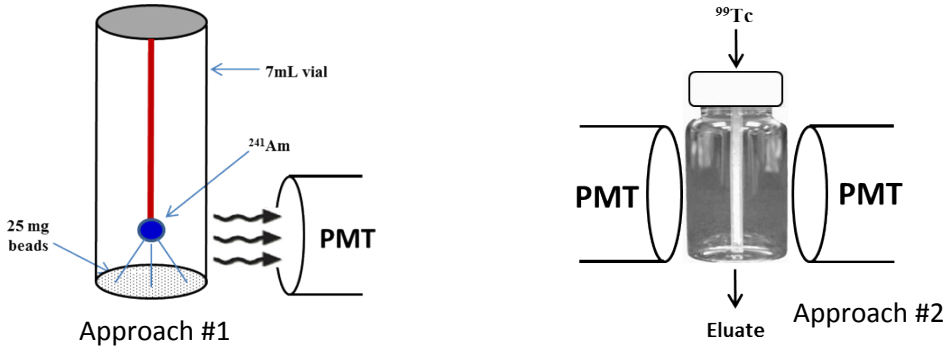

Figure S1. The scintillation measurements were conducted using two different approaches. **1)** About 25mg of the scintillating beads was weighted in 7 mL LSC vial and 1 μCi ^{241}Am point source was positioned at about 0.5 cm above the bead's surface. The light output from α particles deposition was measured using a Hidex Triathler liquid scintillation counter (LSC). **2)** About 50 mg of the functionalized resin was packed in a mini-column tubing (1/8" external, 1/16" internal diameters). After conditioning the column with the background solution the radionuclide was passed through where the selective group catches it. The mini-column was centered in the middle of LSC vial and counted off-line with LSC.

Calculation of the Quantum Yield of Fluorescence for NPO Fluors

The quantum yield (QY) of fluorescence was calculated in accordance to a procedure described in: http://www.fluortools.com/software/ae/documentation/qy
αNPO was used as a reference material with known QY (99-100% in accordance to literature). Four diluted solutions (0.012 mM; 0.022 mM; 0.034 mM and 0.047 mM) in methylacetate were prepared for each fluor under study (including αNPO) and UV-vis absorption and fluorescence emission curves were recorded for them using the same experimental conditions (i.e., the same wavelength scanning range, quartz cuvette, excitation wavelength, gain and slit bandwidths).
The QY was then calculated as:

$$\mathrm{QY} = \mathrm{QY}_{\mathrm{ref}} \frac{\eta^2}{\eta_{\mathrm{ref}}^2} \frac{I}{A} \frac{A_{\mathrm{ref}}}{I_{\mathrm{ref}}}$$

where $\mathrm{QY}_{\mathrm{ref}}$ is the quantum yield of the reference compound (αNPO, 100%), η is the refractive index of the solvent, I is the integrated fluorescence intensity and A is the absorbance at the excitation wavelength (345 nm).

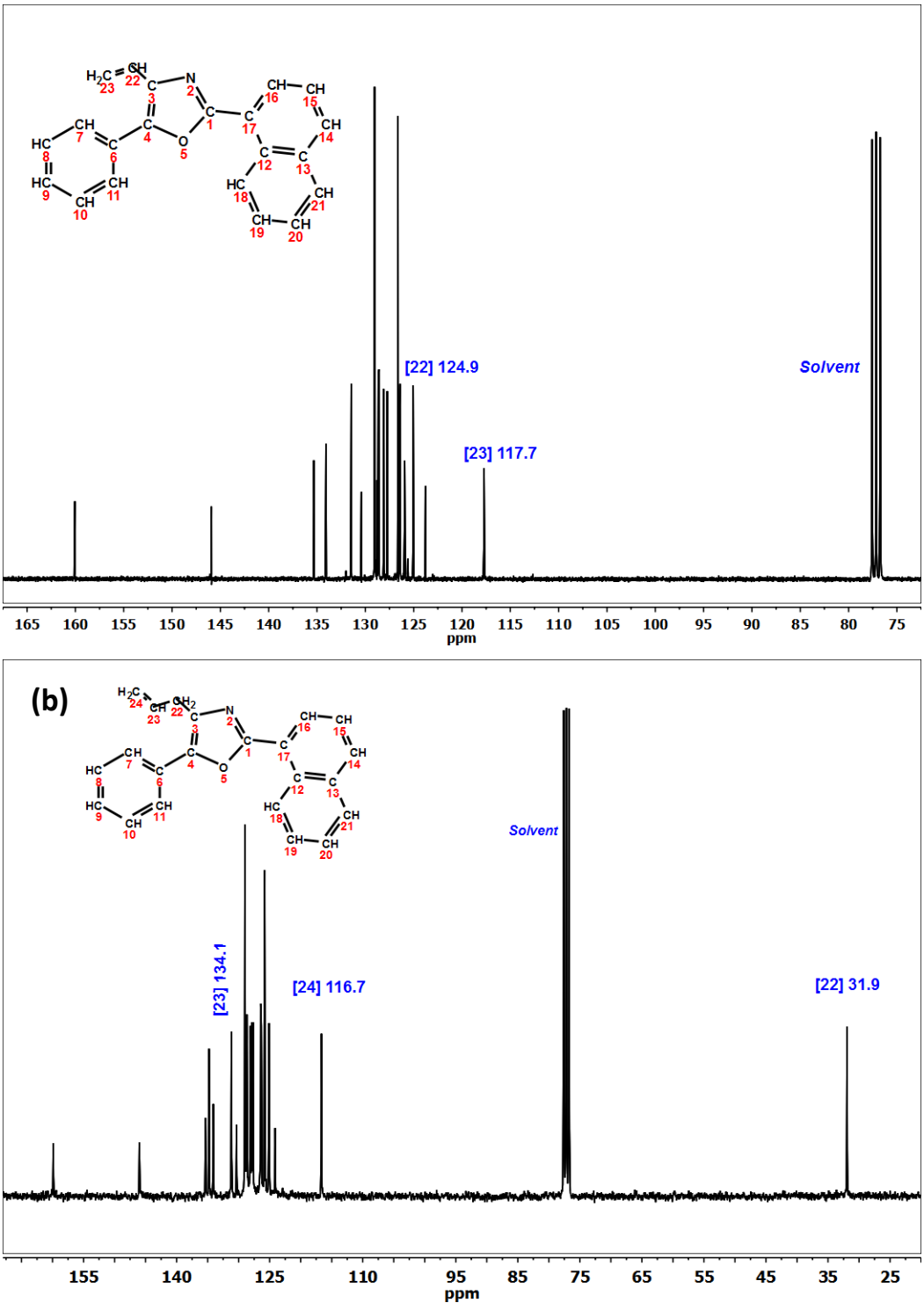

Figure S2. ^{13}C NMR experimenta analysis of vNPO (a) and allylNPO (b). Cxx refers to the carbon atom on the molecule.

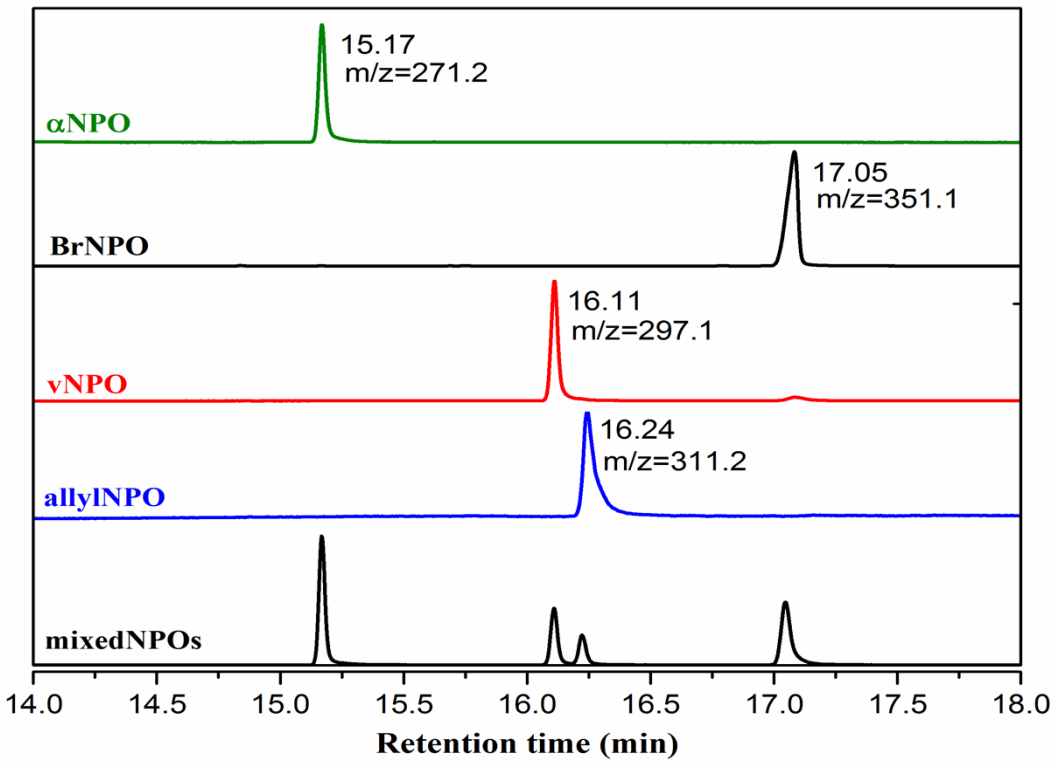

Figure S3. GCMS chromatograms of αNPO and its derivatives BrNPO, vNPO and allylNPO as pure and mixed materials.

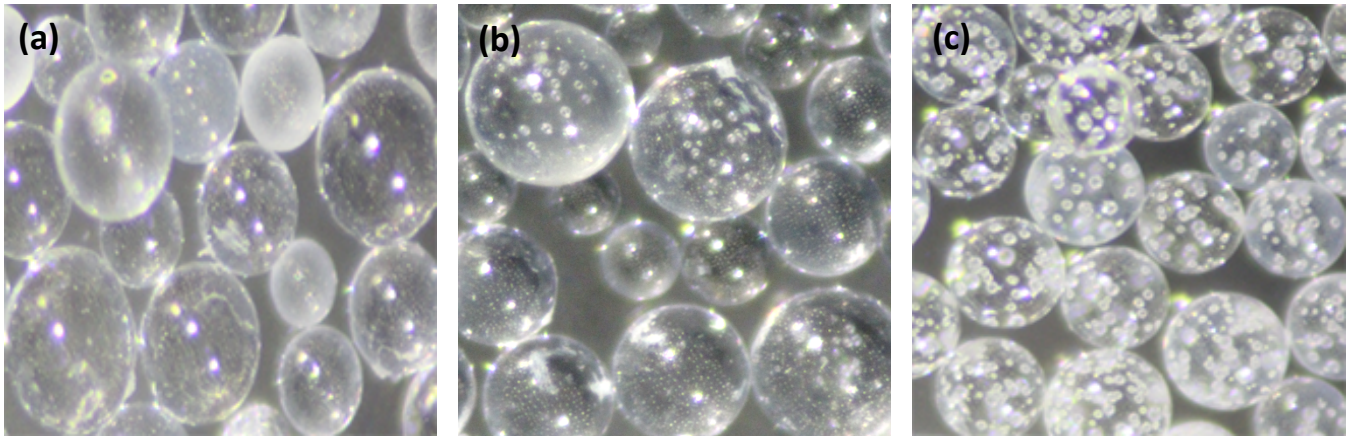

Figure S4. Optical images of the plastic scintillating resins. P-αNPO (a) P-vNPO (b) and P-allylNPO (c).

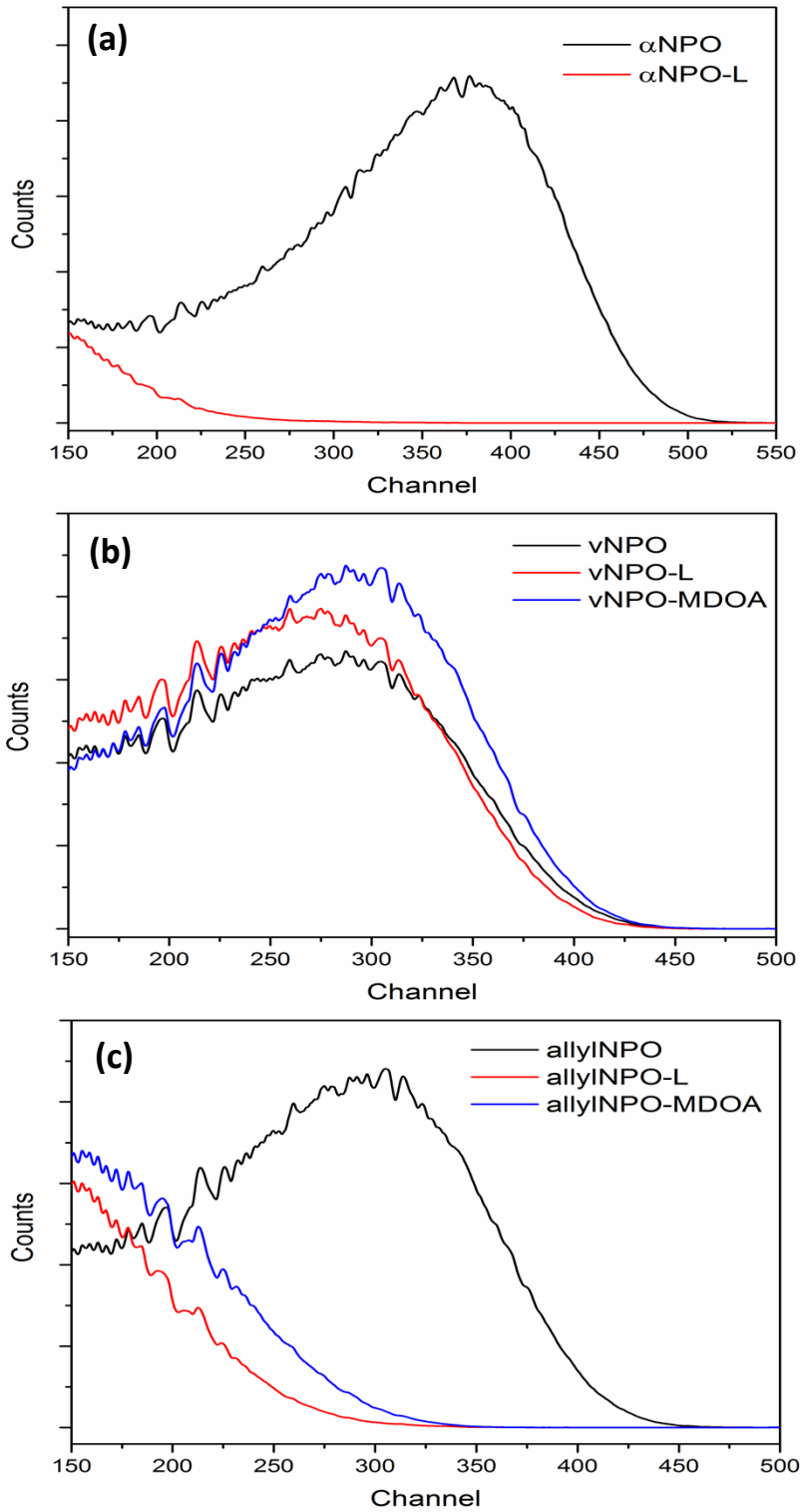

Figure S5. The scintillation efficiency of the unwashed (NPO), washed (NPO-L) and aminated (NPO-MDOA) plastic beads of αNPO (a) vNPO (b) and allylNPO (c) after irradiation using α particles from ^{241}Am point source.

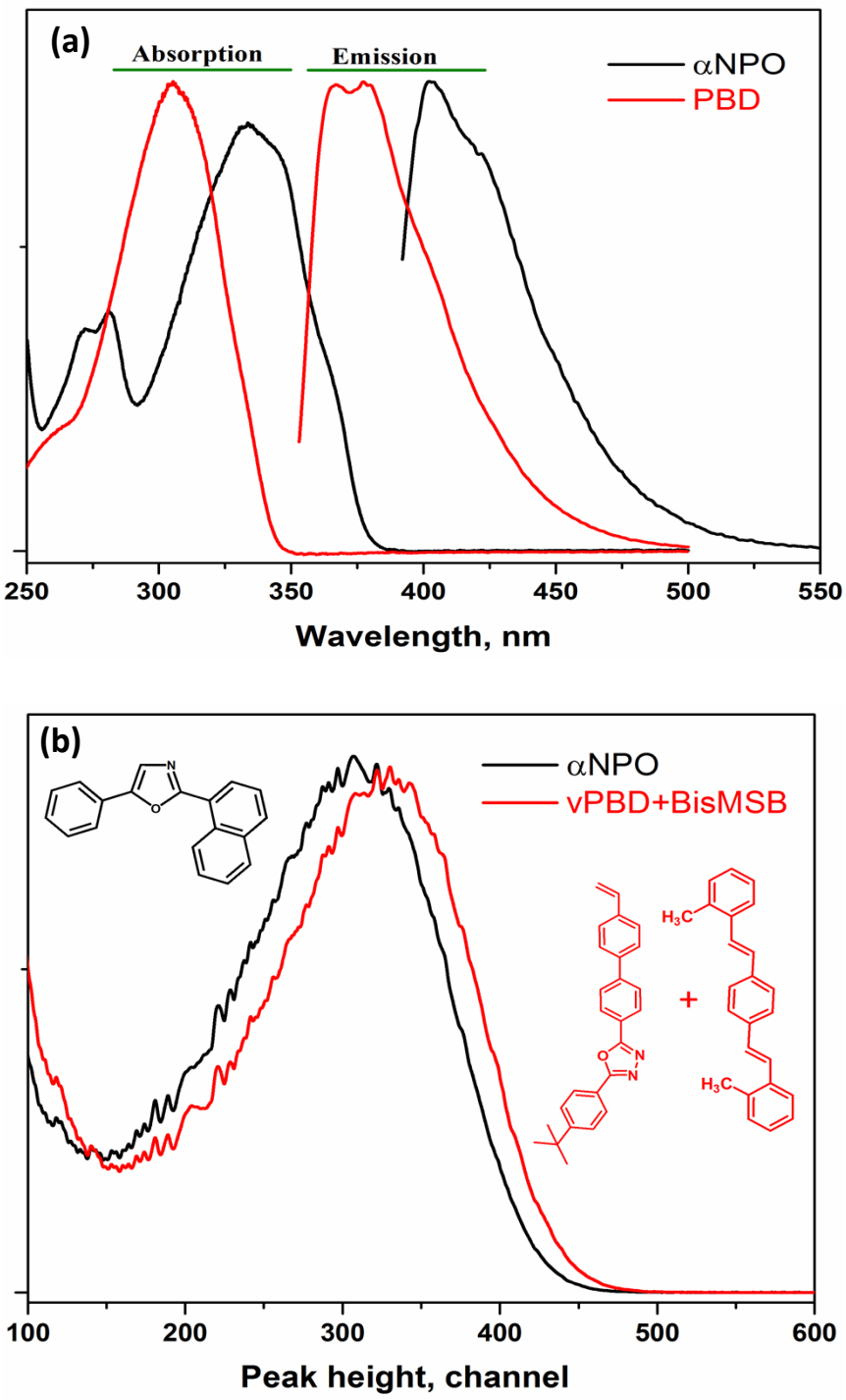

Figure S6. The absorption/emission spectra of αNPO and PBD organic fluors (a); The peak heights of scintillating resins contained αNPO and vPBD+BisMSB after irradiation using α particles from ^{241}Am point source (b).