

**Supporting Information**

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**Thermo- and radioluminescent polystyrene based plastic  
scintillators doped with phosphorescent Iridium(III) complexes** F.

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Table of Content

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Photophysical properties of iridium complexes

S2-S11

## Preparation of the samples

The general procedure for plastic scintillators preparation is as follows: in a flame-dried round bottom flask filled with argon, powders were dissolved in the monomers. Remaining gases were removed using the freeze-pump-thaw technique, and the solution was carefully transferred into a vial for conducting polymerization. After completion, the vial was broken with a mallet and the scintillator was obtained after polishing the raw material. The contours and the back were ultimately covered with TiO<sub>2</sub> paint (3 layers, EJ-510 from Eljen Technologies) for better light collection through reflection.

## Characterization

UV-visible spectra were measured at room temperature in chloroform on a Jenway 6715 UV/Vis spectrometer, wavelengths are given in nm and extinction coefficients  $\epsilon$  are presented in L.mol<sup>-1</sup>.cm<sup>-1</sup>. Emission spectra were recorded on chloroform and polymer matrix on a Horiba Jobin-Yvon Fluoromax 4P spectrofluorometer. All scintillators were compared with approximately the same morphology (diameter, thickness). Plastic scintillator EJ-200 was obtained from Eljen Technologies and was used as reference. Radioluminescence spectra were acquired by using the following procedure. In the Fluoromax 4P spectrofluorometer, the excitation light was shut down. In the centre of the experimenter chamber, <sup>90</sup>Sr/<sup>90</sup>Y  $\beta$  emitting source (25 MBq) placed at 1 cm away from the scintillator irradiates the plastic scintillator located close to the detection cell. Spectra were acquired with integration time 5 s/nm. Two types of blank spectra were recorded: one with the plastic scintillator without source and one with the source without scintillator.





















