

## Thermoluminescence properties of recycled window glass doped some of transition metal oxides (TiO<sub>2</sub>, V<sub>2</sub>O<sub>5</sub>, CrO<sub>3</sub>, MnO<sub>2</sub>, Fe<sub>2</sub>O<sub>3</sub>, Co<sub>2</sub>O<sub>3</sub>, NiO and Cu<sub>2</sub>O) as radiation dosimetry materials

Thermoluminescence properties of Thai commercial window glass provided by Guardian Industries Corporation (denoted as WG) were studied. WG was doped with varying concentrations of different transition metal oxides (TMOs). The composition of glass is 90WG-10Na<sub>2</sub>O-xTMOs (where TMOs = TiO<sub>2</sub>, V<sub>2</sub>O<sub>5</sub>, CrO<sub>3</sub>, MnO<sub>2</sub>, Fe<sub>2</sub>O<sub>3</sub>, Co<sub>2</sub>O<sub>3</sub>, NiO, Cu<sub>2</sub>O and x = 0.000, 0.001, 0.010, 0.100, 1.000 mol%). Glass samples were recycled by using melt quenching technique and cut into the dimensions of 6×6×1 mm<sup>3</sup>. After irradiated glass samples with X-ray at photon energy 160 keV in absorb dose rang 0-14 mGy, the glow curve structure, TL sensitivity, linearity and minimum detectable were investigated. The results of this work demonstrated that the optimum type and concentration of TMOs is Cu<sub>2</sub>O at 0.010 mol%, because this glass sample showed single peak at 225 °C, the highest sensitivity, the best linearity of the dose responses and the lowest minimum detectable compared to all of the glass samples in this work.

Keywords: Thermoluminescence glass, Thai window glass, transition metal oxides

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