

Luminescent nanomaterials containing rare earth ions for security printing

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Abstract: The high-efficiency luminescent nanomaterials with different emission wavelengths of red ($\text{YVO}_4:\text{Eu}^{3+}$), green ($\text{CePO}_4:\text{Tb}^{3+}$), $\text{ZnS}:\text{Mn}^{2+}$ and $\text{YVO}_4:\text{Eu}^{3+}@\text{SiO}_2$ were successfully prepared with different concentrations of Mn and rare earth ions as active centres by chemical synthesis. Structure properties were studied. It was found that the particle size of our samples was in the range of 10-30 nm. Photoluminescent properties were studied under 325, 337, 365 and 370 nm excitations in order to apply in luminescent labels. The primary colour components are red and green emission making them very convenient and attractive for screen security printing systems. Hundreds of different labels with a size of 1-10 cm² were prepared by screen-printing as well as inkjet printing. By improving the Epson printer, commercial red, green and blue inks were used in the printing application. Screen and inkjet printing were deemed good methods for security printing. Our products were beautiful, high resolution and withstood tropical weather. Copyright ?? 2011 Inderscience Enterprises Ltd.

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