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Nanophosphors for radiation dosimeter used for personal monitoring

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The programmable OSL (Optically stimulated Luminescence) reader systems are in great demand in all the research and academic institutions for their applications in advanced radiation dosimeters research Dosimeters for personnel monitoring are required in radiation department. The YAG:Ce phosphor developed in 1967 by Blasse and Brill has been practically used as cathode ray tube phosphors (P 46 and P 48) [1]. Blasse and Brill [2] also showed that this phosphor emitted in yellow region when excited by blue light. Photoluminescence (PL) characteristics Ce&Yb co-doped with YAG phosphor has been shown in Figure 1. Modifications brought in the PL characteristics by substitutions continue to interest researcher to date [3].
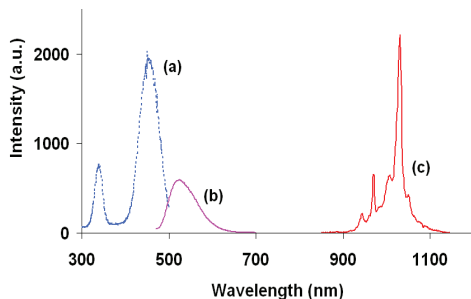

Figure 1: PL characteristics of Ce & Yb co-doped with YAG phosphor

YAG:Ce^{3+},Yb^{3+} is a co-doped YAG sample which is a well-known commercial phosphor used in LED lighting industry. The phosphor is made by a modified one-step combustion synthesis method.
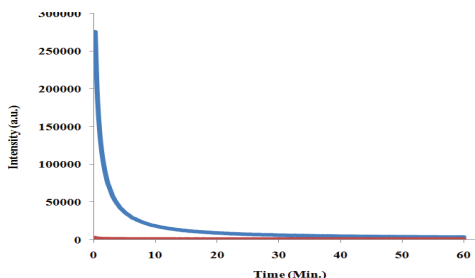

Figure 2: OSL graph of YAG:Ce,Yb phosphor

The OSL graph of YAG:Ce,Yb phosphor shows intense optically stimulated luminescence, as the Yb concentration increases OSL also increases (Figure 2). Hence this phosphor can be used for detection in radiation dosimeters.

References

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2. G.Blasse and A.Brill, J.Chem.Phys 47 (1967) 5139
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