

Submicro-crystals of $\text{BaWO}_4:\text{Eu}^{3+}$ and $\text{BaMoO}_4:\text{Eu}^{3+}$ synthesized by Pechini Method

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In the scheelite-related red phosphors, molybdate and tungstate are respectable high-quality host material. The central metal ions, Mo^{6+} and W^{6+} , are coordinated to four oxygen atoms in tetrahedral symmetry (Td). Then, molybdate and tungstate demonstrate be chemically stable, red-emitting phosphors, very suitable for in lightning and bio-application.[1] Additionally, molybdate and tungstate phosphors have broad absorption bands owing to charge transfer (CT) from oxygen to metal in the near-UV region. Scheelite BaMoO_4 and BaWO_4 have almost ideal structure of the MO_4^{2-} and display excellent thermal and hydrolytic stability [2-3]. Rare Earth Molybdates and Tungstate $x\% \text{Eu}:(\text{BaMO}_4)_3$ submicron materials with smart photoluminescent properties were prepared using Pechini method. The powders were characterized by XRD, infrared absorption spectroscopy, thermal analyses, Scanning Electronic Microscopy and a criterions study of PL properties. These rare earth doped materials present highly intense red (Eu^{3+}), luminescence under UV radiation. The structure change with the concentration of dopand, in this case concentration of Eu^{3+} . The excitation spectra of these compounds presented broad bands arising from ligand-to-metal charge transfer ($\text{O} \rightarrow \text{Mo}^{6+}$, $\text{O} \rightarrow \text{W}^{6+}$ and $\text{O} \rightarrow \text{Eu}^{3+}$) and narrow bands related to $4f-4f$ intraconfigurational transitions. The emission spectra exhibited the $^5\text{D}_0 \rightarrow ^7\text{F}_J$ ($J=1-4$) transitions, for the systems doped with Eu^{3+} , while a broad band assigned to the LMCT ($\text{O} \rightarrow \text{Mo};\text{W}$) are observed when the excitation is monitored on the $\text{O} \rightarrow \text{Mo};\text{W}$ LMCT state around 286 nm

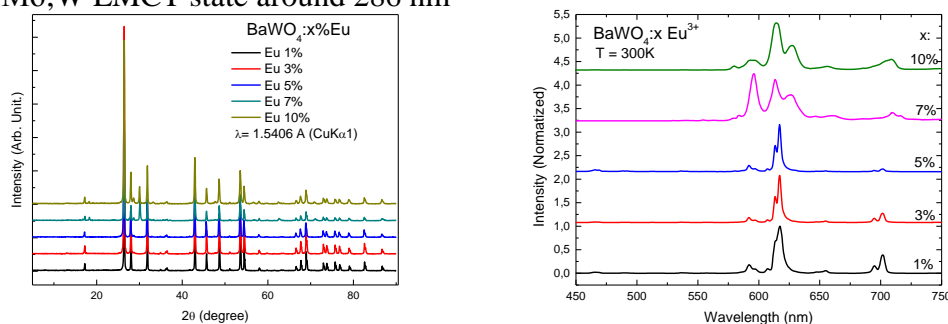


Fig. 1. XPD patterns of the $\text{BaWO}_4:\text{Eu}^{3+}$ materials prepared by Pechini method (left) and emission spectra of the $\text{BaWO}_4:\text{Eu}^{3+}$ under excitation at (right)

Keywords: Europium luminescence, Molybdate and tungstate, lightning.

Acknowledgements

This work was supported by CNPq, CAPES and FAPESP.

References

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