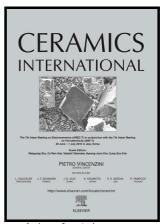
## Author's Accepted Manuscript

Largely enhanced mechanoluminescence properties in  $Pr^{3+}/Gd^{3+}$  co-doped LiNbO<sub>3</sub> phosphors

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### **ACCEPTED MANUSCRIPT**

Largely enhanced mechanoluminescence properties in  $Pr^{3+}/Gd^{3+}$  co-doped LiNbO<sub>3</sub> phosphors

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#### **Abstract**

Pr<sup>3+</sup>/Gd<sup>3+</sup> co-doped LiNbO<sub>3</sub> phosphors were prepared by a traditional solid-state reaction method and their structure, photoluminescence, mechanoluminescence and thermoluminescence were investigated. The results showed that the LiNbO<sub>3</sub> phase with a rhombohedral structure and an R3c space group was successfully prepared.

Mechanoluminescence intensity in nonstoichiometric LiNbO<sub>3</sub>:Pr<sup>3+</sup> was largely increased by introducing Gd<sup>3+</sup> ions. The optimal co-doped concentration of Gd<sup>3+</sup> was 1mol% and the enhanced ML intensity of LiNbO<sub>3</sub>:0.01Pr<sup>3+</sup>, 0.01Gd<sup>3+</sup> was about 177% times compared with that of LiNbO<sub>3</sub>:0.01Pr<sup>3+</sup>. The effect of Gd<sup>3+</sup> co-dopants on trap levels were explored through thermoluminescence curves. The enhancement of

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