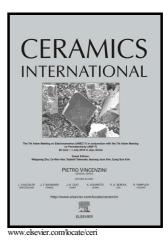
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#### ACCEPTED MANUSCRIPT

## Competitive nanocrystallization of Na<sub>3</sub>ScF<sub>6</sub> and NaYbF<sub>4</sub> in aluminosilicate glass and optical spectroscopy of Ln<sup>3+</sup> dopants

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#### Abstract

The precipitation of monoclinic Na<sub>3</sub>ScF<sub>6</sub> nanocrystals from aluminosilicate glass with specially designed compositions of SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub>-Na<sub>2</sub>O-NaF-ScF<sub>3</sub>-YbF<sub>3</sub> was achieved for the first time. Impressively, competitive nanocrystallization of cubic NaYbF<sub>4</sub> and monoclinic Na<sub>3</sub>ScF<sub>6</sub> has been evidenced to be dependent on  $Na^+$  content and F/Na ratio in glass. Adopting  $Er^{3+}$  and  $Eu^{3+}$ dopants as structural probes, optical spectroscopic analyses verified that these emissive centers preferred to partition into NaYbF<sub>4</sub> nanocrystals rather than Na<sub>3</sub>ScF<sub>6</sub> ones.

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