

# Effect of Na co-doping on the OSL properties of $K_2SO_4:Ce$

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Potassium sulfate doped with cerium ( $K_2SO_4:Ce$ ) has been recognized to exhibit optically stimulated luminescence (OSL) with emission in the green spectral region, making it a promising candidate for radiation dosimetry applications[1-3]. Previous studies have shown that co-doping with alkali metal ions (e.g.,  $Na^+$ ) can significantly enhance luminescence efficiency in various OSL phosphors, including sulfate-based systems [4-6]. In this work, sodium (Na) was introduced as a co-dopant to investigate its influence on the OSL intensity of  $K_2SO_4:Ce$ .

A series of samples with varying concentrations of Ce and Na were synthesized using a controlled preparation method, followed by thermal treatment at 1000 °C for 4 hours to ensure proper crystallization and dopant incorporation. The study focused on optimizing the relative concentrations of Ce and Na to achieve maximal OSL signal intensity. An optimal combination of Ce and Na concentrations yielding the highest luminescence efficiency was identified. The findings provide insight into defect engineering in sulfate-based phosphors and contribute to the development of improved OSL materials.

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