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**Spectrally resolved thermoluminescence of pure potassium chloride crystals**

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## ABSTRACT

Alkali halides are wide band gap dielectric materials, which are very important for luminescence dosimetry. Nevertheless, only some of them were studied comprehensively. Potassium chloride (KCl) is alkali halide material, which shows pronounced thermoluminescence (TL) and optically stimulated luminescence (OSL). The material occurs also in natural mineral form as sylvite (or sylvine). This paper presents results of spectrally resolved thermoluminescence (SR-TL) measurements of pure KCl crystals in temperature range 300-550 K for various doses of beta irradiation. Four emission bands were found relating to different recombination centers in this material. TL curves relating to these centers have different shape. It indicates that recombination centers are not filled concurrently.

*Keywords:* Thermoluminescence (TL), spectrally resolved thermoluminescence (SR-TL), potassium chloride (KCl), beta irradiation, trap levels, recombination centers

## INTRODUCTION

Alkali halides are well-known wide band gap ( $E_g=8 - 12$  eV) materials, which are very important for luminescence dosimetry. Many of them exhibit pronounced thermoluminescence (TL) and optically stimulated luminescence (OSL) after irradiation by high-energy photons or particles (cf. McKeever, 1985). Differently doped LiF detectors, e.g. LiF:Mg,Ti and LiF:Mg,Cu,P are the most sensitive and stable TL detectors (McKeever, 1985; Bilski, 2002; Bilski et al., 2008; Mandowska et al., 2002, 2010). It has been demonstrated that radiation doses in the range of about 1  $\mu$ Gy to 1 MGy, can be measured using a single

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