KCI:Eu^<2+>結晶の熱蛍光による太陽光中の紫外線 量計測

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雑誌名	平成5(1993)年度 科学研究費補助金 一般研究(C)
	研究成果報告書概要
巻	1992 1993
ページ	2p.
発行年	1995-03-26
URL	http://doi.org/10.24517/00066888

1993 Fiscal Year Final Research Report Summary

UV light measurements of the sunlight using thermoluminescence of KCl : $Eu^{<2->}$

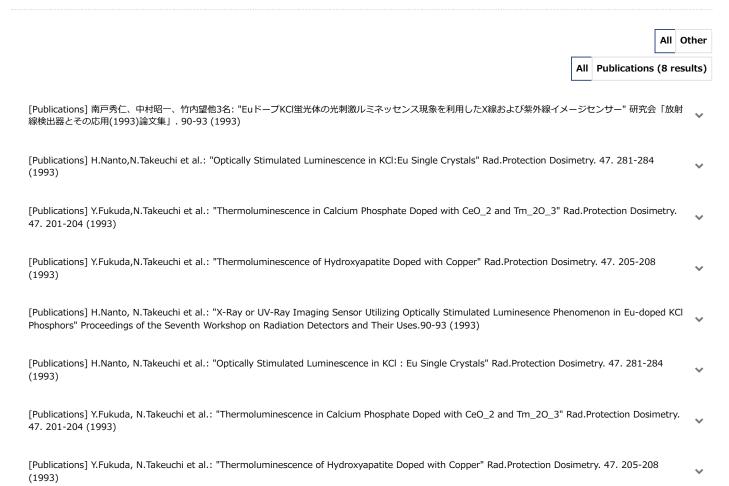
Research Project

Duringt / Augus Alleman
Project/Area Number
04650012
Research Category
Grant-in-Aid for General Scientific Research (C)
Allocation Type
Single-year Grants
Research Field
Applied materials
Research Institution
Kanazawa University
Principal Investigator
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Project Period (FY)
1992 – 1993
Keywords
Europium / Alkalihalide Single Crystal / Sunlight / UV Dosimetry / Thermoluminescence
Research Abstract

UV light irradiation followed by heating a single crystal of KCl doped with divalent europium ions was shown to produce thermoluminescence (TL) glow peaks which may provide a unique method for UV dosimetry of the sunlight. In this work several experimental conditions were investigated to measure the UV light and the results are summarized as follows.

- (1) The UV light in the range from 200 to 320nm was shown to be effective for measurements of the TL glow peaks. The most effective UV light was found at the wavelength around 250nm corresponding to Eu^<2+> [^8S_<7/2>(4f^7) to t_<2g>(4f^65d)] transition.
- (2) The TL intensity which was estimated with identical UV light irradiation increased with temperature of the pre-heat treatment of the crystal. The increment as high as 10 times was obtained for the crystal treated at 927K in argon gas atmosphere for 30min compared with untreated one.
- (3) The TL intensity was also found to depend on the europium concentration in the crystal and the optimum concentration was around 100ppm.
- (4) Preliminary measurement of the glow peak after irradiation of the sunlight was successful wth the crystal doped with 100ppm of europium, though the intensity was so weak. The sunlight irradiation was directly carried out onto the crystal placed on the roof of the building of our laboratory in Kanazawa.

Research Products (8 results)



URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-04650012/046500121993kenkyu_seika_hokoku_

Published: 1995-03-26