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## Thermoluminescence of Calcium-Deficient Fluoridated Hydroxyapatite

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## THERMOLUMINESCENCE OF CALCIUM-DEFICIENT FLUORIDATED HYDROXYAPATITE

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We recently found that  $\beta$ -tricalcium bis(orthophosphate) ( $\beta$ -TCP) as well as  $\alpha$ -TCP was readily hydrolyzed to calcium-deficient fluoridated hydroxyapatite (de-FHAp)  $[\text{Ca}_{10-z}(\text{HPO}_4)_z(\text{PO}_4)_{6-z}(\text{F}\cdot\text{OH})_{2-z}\cdot m\text{H}_2\text{O}]$  in the presence of  $\text{NH}_4\text{F}$ .<sup>1</sup> We examined the thermoluminescence (TL) characteristics of de-FHAp with various fluoride contents prepared from  $\alpha$ -TCP and  $\beta$ -TCP. The de-FHAp was compressed and heated at 700°C and 900°C for the TL measurement.

The de-FHAp treated at 700°C showed the TL glow peaks at 90°C and 190°C. The former peak was higher than the latter. On the other hand, TL glow peaks for the sample of 900°C appeared at 50°C, 130°C, and 165°C. The difference of these TL glow curves may be due to the structural change of de-FHAp to a mixture of FHAp and  $\beta$ -TCP when the sample was heated at 900°C. The TL glow peak intensity increased with the fluoride contents in FHAp. The TL intensity of FHAp from  $\alpha$ -TCP was higher than that from  $\beta$ -TCP. The intensity of TL glow peak for 90°C and 190°C increased linearly with the flux of X-ray irradiation up to about 1.8 C/kg.

## REFERENCE

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