

THERMOLUMINESCENCE STUDY OF NATURAL
QUARTZ INCLUSIONS IN SILICATE BRICKS
FOR DOSE RECONSTRUCTION IN AREAS
DOWNWIND OF CHERNOBYL

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S u m m a r y

The potential of calcium silicate brick (CSB) — a construction material widely used in the contaminated settlements downwind of Chernobyl — for its use in retrospective dosimetry has been investigated. The procedure of dose evaluation taking advantage of the 210 °C thermoluminescence (TL) peak of quartz inclusions was examined using CSB samples subjected to the natural or laboratory irradiation. The CSB manufacturing procedure that includes the stage of long-term firing at a temperature of about 200 °C has been shown to facilitate the eviction of charge carriers from the traps associated with the 210 °C TL peak, providing thereby the necessary zeroing of the geological TL signal. The TL sensitivity of quartz has been demonstrated to be sufficient to measure absorbed doses of about 10 mGy and above. When applied to the field specimens from a contaminated settlement, the estimate of the cumulative fallout dose was in a good agreement with the result obtained in the previous study of ceramic (fired) bricks from the same building.