

RADIATION ACCIDENT DOSIMETRY ON ELECTRONIC COMPONENTS BY OSL

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In the event of large-scale radiation accidents and considering a growing terrorism concern, non-invasive and sufficiently accurate retrospective dosimetry methods are necessary to carry out a fast population triage in order to determine which radiation-exposed individuals need a medical treatment. Retrospective dosimetry using telephone chip-cards (Göksu, 2003) has been recently considered. We investigated most chip cards available in France (telephone chip-cards, SIM chip-cards, credit chip-cards,...) and finally very few present dosimetric properties. Therefore, we were interested in potential dosimetric properties of widely used personal objects: mobile phones. The response of different electronic components such as resistor, capacitors and integrated circuits present on mobile phone circuit board (Figure 1) has been investigated with luminescence techniques (OSL, IRSL and TL).

The majority of these electronic components exhibit radiation-induced luminescence signals. The OSL technique is the more promising for these materials. In this presentation, we focus on three types of components (resistor (1), capacitor (2) and integrated circuit (4)) which present the more interesting OSL characteristics (in term of signal annealing and sensitivity) and which are the most often present on mobile phone circuit board.

Preheat effects on the signals, sensitization, dose response curves, signal stability (fading) and results of dose recovery tests will be presented and interests and limits of their use appreciated.

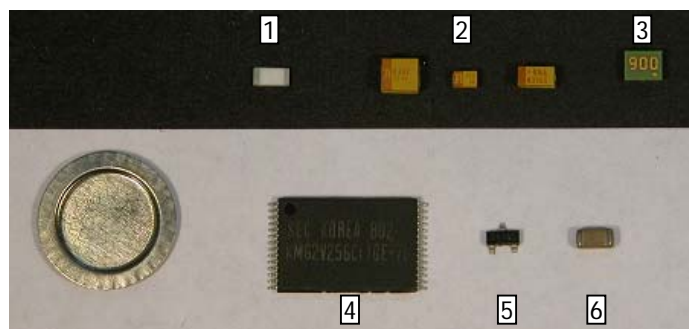


Figure 1. Photograph of electronic components present on a mobile phone circuit board and investigated in this study. A cup of measurement give the scale ($\varnothing = 10$ mm).

1: resistor, 2: tantalum capacitor, 3: resistor, 4: integrated circuit, 5: transistor, 6: capacitor.