

## Low dose radiation dosimetry using natural blue quartz crystal by TL technique

Betzabel N. Silva-Carrera<sup>1</sup>, Nilo F. Cano<sup>2</sup>, Shiguo Watanabe<sup>3</sup>

<sup>1</sup>*Instituto de Pesquisas Energéticas e Nucleares, IPEN-CNEN/SP, Av. Prof. Lineu Prestes, 2242, Cidade Universitária, 05508-000 São Paulo, SP, Brazil*

<sup>2</sup>*Instituto do Mar, Universidade Federal de São Paulo, Rua Doutor Carvalho de Mendonça, 144, CEP 11070-100, Santos, SP, Brazil .*

<sup>3</sup>*Instituto de Física, Universidade de São Paulo, Rua do Matão, Travessa R, 187, CEP 05508-090, São Paulo, SP, Brazil .*

This work presents the results of response of blue quartz for low dose radiation detection. Samples were crushed and sieved, fine powder was used for producing pellets by compressing of powder with a pressure of about 10 ton/cm<sup>2</sup> and sintering at high temperature of about 1200 °C for 60 minutes. Each pellet has a mass of about 50 mg, a diameter of 6.0 mm and 1 mm thickness. The sensitization of the in pellet of blue quartz was done by high doses gamma radiation of 20 kGy and heat treatment at 500 °C for 30 minutes. They are very sensitive gamma-ray detectors with main prominent TL peaks occurring at 230 °C and 300 °C.

These dosimeters were placed on a patient skin undergoing heart scintigraphy for 10 minutes the patient ingered a solution of Tc(99m). An unexpected result was obtained; the peak of 230 °C did not appear in the TL glow curve of the blue quartz. Since the 230°C appears prominent when irradiated with gamma radiation of Co(60) or Cs(137). Similar measurements were carried out in other silicate minerals such as aquamarine and tourmaline, these crystals did not present this unexpected behavior.

We are trying to understand why 230°C peak did not be seen when irradiated with 140 keV  $\gamma$ -ray of Tc(99m).

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