

## Indoor Radon Concentrations in the High Levels of Uranium Deposit of Phanom and Ko Pha-Ngan Districts, Surat Thani Province, Thailand

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**Abstract :** The Phanom and Ko Pha-ngan districts of Surat Thani province are known for their high atmospheric radon concentrations from different sources. While Phanom district is located in an active fault zone, the main radon source in Ko Pha-ngan district is the high amounts of equivalent uranium in the ground surface. Survey measurements of the indoor radon concentrations have been carried out in 105 dwellings and 93 workplaces, using CR-39 detectors that were exposed to indoor radon for forty days. Alpha tracks were made visible by chemical etching and counted manually under an optical microscope. The indoor radon concentrations in the two districts were found to vary between 9 and 63 Bq m<sup>-3</sup> (Phanom) and 12 and 645 Bq m<sup>-3</sup> (Ko Pha-ngan). The geometric mean radon concentration in Ko Pha-ngan district ( $51 \pm 2$  Bq m<sup>-3</sup>) was significantly higher than in the Phanom district ( $26 \pm 1$  Bq m<sup>-3</sup>) at a significance level of  $p < 0.05$  (t-test for independent samples). Nevertheless, only in two dwellings (1%), located in Ko Pha-ngan district, radon concentrations (177 and 645 Bq m<sup>-3</sup>) were found to exceed the limit recommended by the US EPA of 148 Bq m<sup>-3</sup>. The two houses are probably located near to radon sources which, in combination with low air convection, led to increased indoor levels of radon. Our study also shows that the geometric mean radon concentration was higher in workplaces than in dwellings (0.05 significance level) in both districts.

**Keywords :** indoor radon, CR-39 detector, active fault zone, equivalent uranium

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