

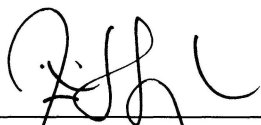
**DETERMINATION OF RADIUM-226 ACTIVITY CONCENTRATION
IN WATER USING LIQUID SCINTILLATION COUNTING (LSC)
TECHNIQUE**

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ABSTRACT

DETERMINATION OF RADIUM-226 ACTIVITY CONCENTRATION IN WATER USING LIQUID SCINTILLATION COUNTING (LSC) TECHNIQUE

The measurement of radioactivity in water allows the determination of population exposure to radiation by the habitual consumption of water. The occurrence of radionuclide in water causes human internal exposure, caused by the decay of radionuclide taken into the body through ingestion and inhalation. The purposes of this study were to determine the activity concentration of radium-226 in water and to compare the value with the allowable limit. Twelve samples were collected along Kelantan River at Kuala Krai and Kota Bahru district. The activity of radium-226 was determined indirectly from its daughter using Liquid Scintillation Counting for filtered and unfiltered samples. From the results, water samples from Sok River (S1), Lebir River (S8), and Sabah Hill (S12), gave high value of radon-222 activity; 1.654 ± 0.85 Bq/L, 1.655 ± 0.24 Bq/L and 1.438 ± 0.49 Bq/L respectively. For radium-226 activity, high value was recorded in water sample from Sok River (S1), Lebir River (S8), and Sabah Hill (S12) with activity of 0.302 ± 0.16 Bq/L, 0.290 ± 0.04 Bq/L and 0.251 ± 0.09 Bq/L respectively. Low radium-226 activity was recorded in sample from Sok River estuary (S5) with value of 0.107 ± 0.03 Bq/L. For the other samples, the activity ranged from 0.142 ± 0.08 to 0.190 ± 0.01 Bq/L. Pearson correlation analysis showed a weak negative correlation between the radium-226 activity with pH and total dissolved solid of the water. Medium correlation showed in the activity with temperature and dissolved oxygen. The concentrations of radium-226 for most of the samples were above than the allowable limit regulated by United State Environmental Protection Agency. Several factors that contributed to the radioactivity are the geographical features and agricultural activity along the river. Further study need to be conducted to understand the routes and mechanisms of this radionuclide entering the human body.