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Improved method for the complete separation of gross alpha and beta in drinking water

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ABSTRACT

During this work, a modified methodology for the separation of gross alpha and beta activity from potable water was established. Complete separation of gross alpha activity was carried out by $Fe(OH)_3$ and $BaSO_4$ precipitation whereas gross beta activity was scavenged by Ca-oxalate and AMP (ammonium molybdate phosphates). The validation of the results was carried out by laboratory spiked experiments, which show a recovery of gross radioactivity in the range of 90–98% with the new methodology. The detection limits using this methodology are 20 mBq/l and 2 mBq/l for gross beta and alpha respectively. These detection limits are two orders of magnitude lower than the maximum acceptable concentration as prescribed by World Health Organisation (WHO) of gross alpha and gross beta activity i.e. less than 0.1 Bq/L and 1 Bq/L, respectively.

Keywords: Potable water; Gross alpha and beta radioactivity; Separation; Drinking water limits; Uranium; Cs-137

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