THE SPATIAL VARIABILITY OF BERYLLIUM-7 DEPTH DISTRIBUTION STUDY

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ABSTRACT: The objective of this paper is to study the spatial variability of 7Be depth evolution in soil profile at two different sampling sites. The soil samples have been collected by using metal core in bare area in Bangi, Selangor and Timah Tasoh, Perlis, Malaysia. Two composite core samples for each sampling sites has been sectioned into 2 mm increments to a depth of 4 cm and oven dried at 45-60 ºC and gently disaggregated. These two composite spatial samples are passed through a < 2 mm sieve and packed into proper geometry plastic container for 7Be analysis by using gamma spectrometry with a 24-hour count time. From the findings, the 7Be content in the soil samples from Bangi, Selangor study area is distributed lower depth penetration into the soil profile than Timah Tasoh, Perlis catchment due to many factors such as precipitation (fallout) and others. However, the spatial variability from both samples study area is also decreases exponentially with depth and is confined within the top few centimeters and similar with other works been reported (Blake et al., 1999; Blake et al., 1999; Blake et al., 1999; Blake et al., 1999; Blake et al., 2000; Matisoff et al., 2002a; Doering et al., 2006; and Walling et al., 2008). Furthermore, a detailed discussion from this study findings will be in full papers.

INTRODUCTION: Fallout radionuclides (FRNs) have been widely used as tracers in numerous studies. The 7Be deposited into the soil surface is predominantly retained in the uppermost soil layers, normally lesser than 2cm from the uppermost layer (Wallbrink and Murray, 1996; Bonniwell et al., 1999; Blake et al., 1999; Walling et al., 1999; Doering et al., 2006; Matisoff et al., 2002a). The precipitation reaches the soil surface primarily as an extremely competitive for cation exchange sites as Be2+ ion due to charge density (Kaste et al., 2002).

OBJECTIVE: The objective of this paper is to study the spatial variability of 7Be depth evolution in soil profile at two different sampling sites in Bangi, Selangor and Timah Tasoh, Perlis, Peninsula of Malaysia due to different geomorphologic and rainfall amount been received annually. The deeper penetration into the soil study is rarely found at depths greater than ca.3-4 cm due to many contributing factors such as the short of half-life and others.

MATERIAL AND METHODOLOGY

RESULTS AND DISCUSSION

7Be depth penetration of two studied areas as shown in figure 5 until figure 8 indicated decreases exponentially with depth and is confined within the top few centimeters and similar with other works been reported (Wallbrink and Murray, 1996; Bonniwell et al., 1999; Blake et al., 1999; Walling et al., 1999; Blake et al., 2000; Matisoff et al., 2002a; Doering et al., 2006; and Walling et al., 2008). Furthermore, the 7Be depth penetration or distribution from both studied areas were occurred in the uppermost soil layer only which that less than 2 cm from the top soil surface. Meanwhile, the 7Be depth penetration or h0 value from Bangi studied area was distributed higher than Timah Tasoh studied area, 2.69 kgm-2 and 4.58 kglm-2 each respectively due to many predisposing factors.

CONCLUSION:

The beryllium-7, 7Be depth distribution for both studied areas were decreased exponentially with depth and is confined within the top few centimeters and similar with other works been reported (Blake et al., 2000) and Walling et al (2008). 7Be depth penetration or h0 value from Timah Tasoh, Perlis was distributed higher than Bangi, Selangor studied area which that 4.58 kglm-2 and 2.69 kglm-2 each respectively. These two different values were due to many predisposing factors such as such as humid precipitation, grain size and geomorphology. However, These two results of the 7Be depth penetration or distribution were not correlated with precipitation (fallout) parameter as the main factor from both spatial studied areas. A further detailed study will be carried out with an extra sampling sites in Peninsula of Malaysia for establishing reference data in near future.

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