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Correlation Results Based on Magnetic Susceptibility Measurements by in-situ and Ex-Situ Measurements as Indicators of Environmental Changes Due to the Fertilizer Industry

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Abstract : Fertilizer industry activities contribute to environmental changes. Changes to the environment became one of a few problems in this era of globalization. Parameters that can be seen as criteria to identify changes in the environment can be seen from the aspects of physics, chemistry, and biology. One aspect that can be assessed quickly and efficiently to describe environmental change is the aspect of physics, one of which is the value of magnetic susceptibility (χ). The rock magnetism method can be used as a proxy indicator of environmental changes, seen from the value of magnetic susceptibility. The rock magnetism method is based on magnetic susceptibility studies to measure and classify the degree of pollutant elements that cause changes in the environment. This research was conducted in the area around the fertilizer plant, with five coring points on each track, each coring point a depth of 15 cm. Magnetic susceptibility measurements were performed by in-situ and ex-situ. In-situ measurements were carried out directly by using the SM30 tool by putting the tools on the soil surface at each measurement point and by that obtaining the value of the magnetic susceptibility. Meanwhile, ex-situ measurements are performed in the laboratory by using the Bartington MS2B tool's susceptibility, which is done on a coring sample which is taken every 5 cm. In-situ measurement shows results that the value of magnetic susceptibility at the surface varies, with the lowest score on the second and fifth points with the -0.81 value and the highest value at the third point, with the score of 0,345. Ex-situ measurements can find out the variations of magnetic susceptibility values at each depth point of coring. At a depth of 0-5 cm, the value of the highest XLF = 494.8 (x10-8m³/kg) is at the third point, while the value of the lowest XLF = 187.1 (x10-8m³/kg) at first. At a depth of 6-10 cm, the highest value of the XLF was at the second point, which was 832.7 (x10-8m³/kg) while the lowest XLF is at the first point, at 211 (x10-8m³/kg). At a depth of 11-15 cm, the XLF's highest value = 857.7 (x10-8m³/kg) is at the second point, whereas the value of the lowest XLF = 83.3 (x10-8m³/kg) is at the fifth point. Based on the in situ and exsit measurements, it can be seen that the highest magnetic susceptibility values from the surface samples are at the third point.

Keywords : magnetic susceptibility, fertilizer plant, Bartington MS2B, SM30
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