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Statistical analyses of the results of the XRF analysis of lead contaminated soil and sequential extraction based on t-test

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A statistical analysis and hypothesis testing was carried out on the randomly selected samples from experimental results of the XRF analysis and sequential extraction of soils contaminated with lead using lead nitrate of known amount. Looking at our previous experimental results, we found that the concentration of the solid contaminated samples: OL S 1-2, & OL S 3-2 (2,080.26, & 2,080.41mg/kg) respectively in that order are very close to the concentration of lead also obtained using the XRF analysis for the liquid solutions obtained from the sequential extraction procedures of soil samples: 'OL S 1-2, & 3-2 as (2,110 mg/kg, & 2,090 mg/kg) respectively in that order. A hypothesis testing was conducted within the underlying assumptions based on the null hypothesis and our claim for equal means. The p-value found was greater than the α-value, and also corroborating this fact, the t-statistics calculated absolute value is less than the critical value at the 5% significant level as presented and shown in our table of results. We can quite well agree from our previous results findings, and corroborated by the findings of the statistical testing, we can confident agree the results from the XRF are reliable enough, without any need to do the sequential extraction for obtaining the concentrations.

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