Title : Validation of Testing Methods for Humic Acid and Organic Matter Determination

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ABSTRACT

Humic acid is an organic substance that plays a significant role in improving soil structure and chemical properties, such as enhancing water retention and increasing the efficiency of essential nutrient absorption for plants. Recently, various forms of humic acid products are available, and the validation of testing methods for humic acid and organic matter determination in different sample types using statistical analysis is crucial for enhancing accuracy of the test results. This study assessed the humic acid content in six types of samples: Leonardite, anthracite coal, bituminous coal, lignite coal, potassium humate, and humic acid (1-5% solution), following the ISO 19822:2018 standard. Additionally, the Walkley and Black Wet Oxidation method was employed to determine the organic matter content in certain samples. The results showed that analyzing the humic acid content according to the ISO 19822:2018 standard in lignite coal J, potassium humate, Leonardite, and humic acid (1-5% solution) using 1 g of sample and 10 mL of solution yielded acceptable %RSD values. For anthracite and bituminous coal, 5 g of sample and 25 mL of solution were used, also with acceptable %RSD values. F-test and T-test analysis indicated that the variability between tests using 1 g and 5 g samples was statistically significant. Furthermore, the analysis of organic matter content in Leonardite and potassium humate samples revealed that samples with high organic matter content, such as Leonardite and potassium humate, could be tested using a 0.10 g sample weight while maintaining acceptable %RSD values.

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