Research & Review in Electrochemistry

Opinion | Vol 11 Iss 4

A New Electrochemical Detection Technique for Organic Matter Content in Ecological Soils

Enbo Li*

Editorial Office, Research and Reviews on Electrochemistry, UK

***Corresponding author:** Enbo Li, Editorial Office, Research and Reviews on Electrochemistry, UK; E-Mail:

publisher@tsijournals.com

Received date: July 08, 2021; **Accepted date:** July 17, 2021; **Published date:** July 25, 2021

Opinion

Rapid detection of organic matter in soil is of major importance in agriculture, but current approaches necessitate laboratory operation. As a result, the development of a technique for detecting soil organic matter quickly in the field is of great interest. There is an electrochemical-based method for detecting organic content in soil particles in this paper. We used graphene to cover the soil particles because soil particles fixed directly on the electrode surface can slip off during testing. The encapsulated soil particles can be fixed on the electrode surface for long periods of time. The electrochemical behaviour of soil particles has been studied. The findings reveal a link between the organic matter content of soil particles and their electrochemical oxidation and reduction.

One of the most important markers of soil nutrient supply capacity and fertility is the amount of organic matter in the soil. Scholars of soil studies generally agree that there is a strong link between soil organic matter concentration and soil quality. One of the most significant aspects of evaluating the ecological environment is knowing how much organic matter is in the soil. Currently, soil organic matter content is determined in the laboratory using external potassium dichromate heating and a combination of spectroscopic/chromatographic analytical techniques such nuclear magnetic resonance and thermal cracking-mass spectrometry. These systems offer the advantage of increased measurement precision, but they necessitate a large number of operators and a longer detection time, as well as a considerable amount of reagents consumed during the monitoring process.

Near-infrared spectroscopy has evolved into a multi-component simultaneous analysis technology that is quick andnondestructive. The investigations discovered that two elements affect the spectrum reflectance qualities of soils: the moisture content of the soil and iron-containing oxides, due to the complex composition of soils.

There is a strong link between soil moisture content and spectrum reflectance, with an increase in soil moisture content leading to a decrease in spectral reflectance. Furthermore, the presence of iron oxides reduces spectral reflectance, and iron oxides create many characteristic absorption. The detection of organic matter in soil allows us to gain a better understanding

Citation: Li E. A New Electrochemical Detection Technique for Organic Matter Content in Ecological Soils. Res Rev Electrochem. 11(4):137

of the dynamics of soil fertility, which is critical for increasing agricultural resource utilisation and modern agricultural management. In this paper, we present an alternate method for determining the organic matter content of undigested/dissolved soil samples utilising the SSEAC fast detection methodology. Soil particles include a variety of plant-derived organic matter compounds, some of which, including indoles, polyphenols, and quinones, are capable of electrochemical oxidation and/or reduction reactions. For highly sensitive signal capture, the encapsulated soil particles were directly adsorbed on the surface of a printed electrode with an integrated three-electrode system. Analytical models were developed for the analysis of soil organic matter content at each of the three sites based on different modeling approaches.