

STATUS OF MINERAL AND STRUCTURE OF SOIL POSITION AT SONAVAD

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Abstract:

Soil samples were collected from Outlying area of Sonavad village of Shahada tehsil of Maharashtra, India. Identification of minerals from these soil samples were approved by with X-Ray Diffraction and Scanning electron microscopy technique. The X-Ray Diffraction outcomes displayed the existence of several minerals. X-Ray Diffraction Method is non-destructive and can be used in the finding of mineralogical configuration. Microstructural examination of soil is approved out by using Scanning electron microscopy technique. Peak intensity are categorized as dominant, medium, weak and trace. Permitting to these peak intensity occurrence of minerals in the soil are categorized. There are several types of minerals present in these soil.

Keywords: XRD, SEM minerals, Diffraction, Soil etc.

Introduction:

Soil helpful for plants growth, as it comprise of nutrient reservoir, these nutrients are obtained from soil minerals and as the locality for much geobiochemical development involved in deterioration and reutilizing of plant and animal products [1]. Soil class is significant because it affect air and ground water status through exchanges with the air and as a storing and purifying medium for water as it passes through the soil. Soil has major part in incorporates, transmutes, stores and filters material related to its ecological and management conditions in the spatial perspective [2]. Soil reserve is non-renewable object in human phase scales [4]. The significance of soils to development is documented by the numerous earliest civilizations, some of which misused because of mismanagement and wasted the soils on which they survive [5].

Interpretation of mineralogical arrangement of soil is significant constraint to the suitable understanding of soil growth, potency grade as well as development of management performs for cost-effective crop production. The kinds of mineral existing in soil has effect on availability of major and micro-nutrients to the crops. Mineralogy of soil is resolute regularly since of its solid effect on soil activities, its practice in soil classification, and position to soil genetic procedures [6].

A. Experimental:

a) Extraction and Concentration of Soil Samples:

Soil samples are collected from different location of Sonavad surrounding agricultural field are mixed suitably. 500 gm. well crushed soil sample was in used in a one liter measuring vessel and mixed with one liter of distilled water, and then this soil solution is stirred and shaken for 30 minutes with automatic shaker. After appropriate shaking kept this soil solution for the 12 hrs. And later day the supernant liquid was detached with the help of pipette in to a plastic bottles. This fluid sample is concentrated with the help of centrifugation on centrifugal appliance at 4000 rpm for 10 min. then these centrifuged samples were preserved in a glass bottle.

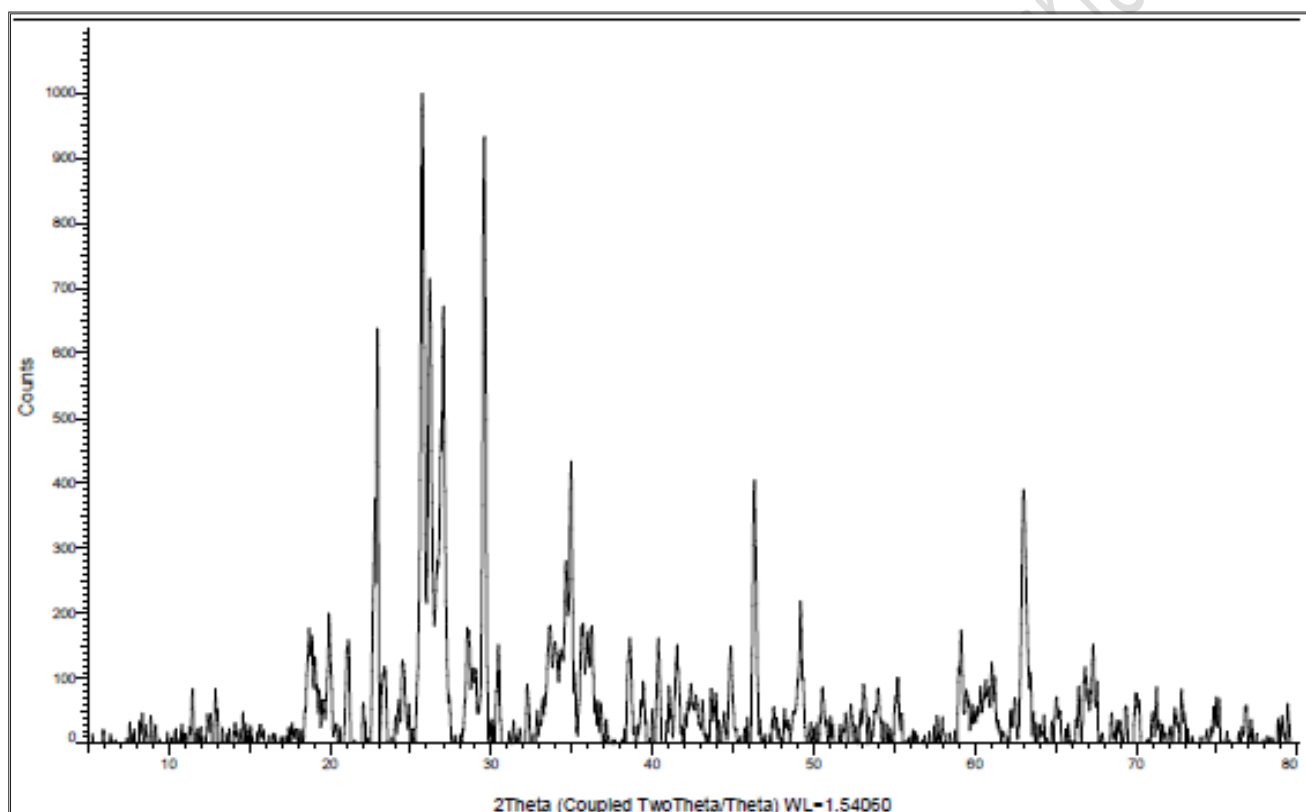


b) Most known process of mounting sample for X-ray study is the preparation of oriented sample on microscopic glass slide or on permeable ceramic plates. Suspension of soil is finished suitably and placed on the slide. Therefore about 15-25 mg of soil sample is available per 10 cm^3 . Then the sample is allow to dry at room temperature. Now this sample is set for study with direct recording X-ray diffractometer, in which X-ray graph result on charts. Usually the results are shown in terms of 2θ values. Valuation of soil mineralogy SEM examination of the sample was carried out at University department of chemical technology of North Maharashtra University Jalgaon.

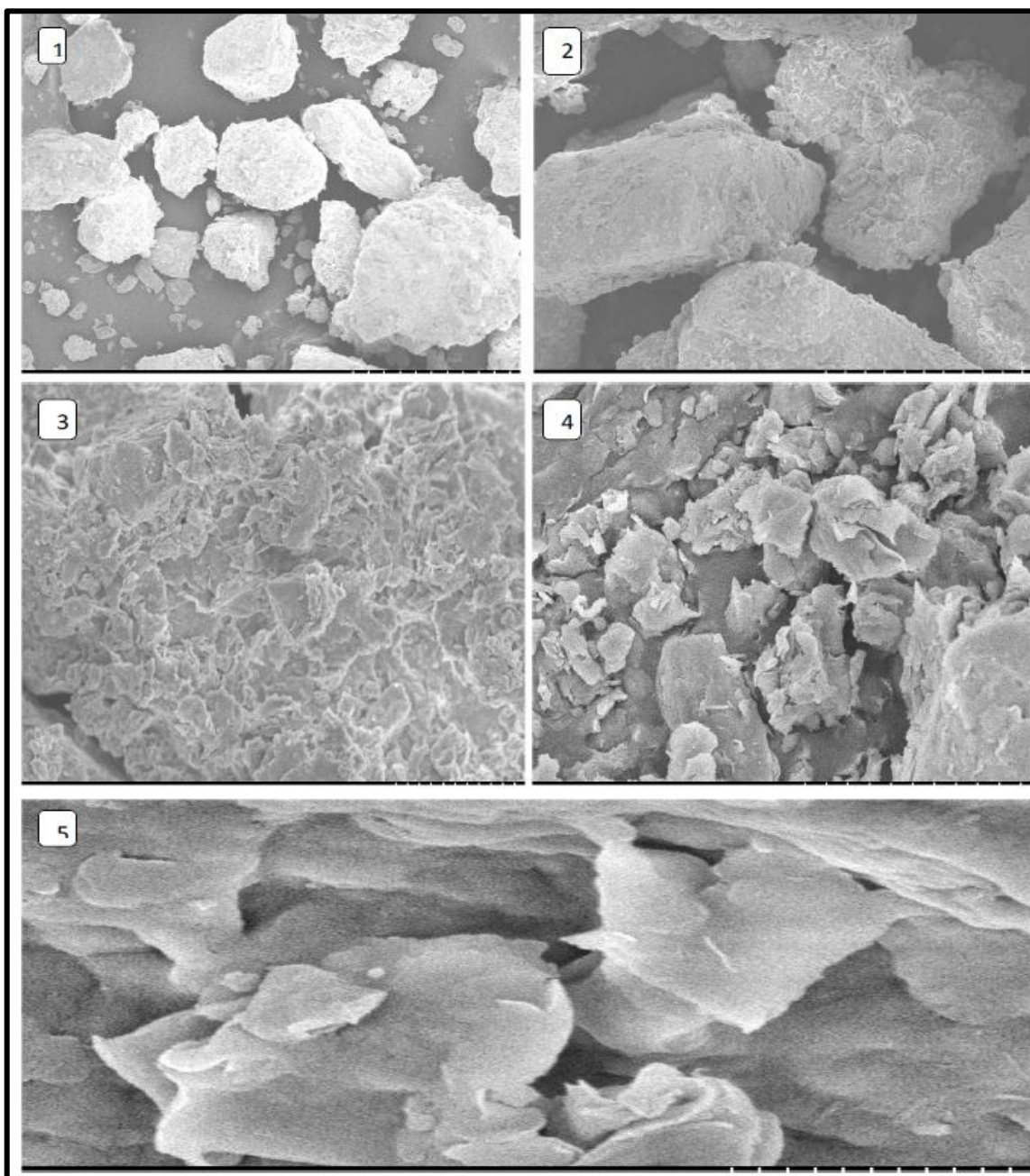
Results and Discussion :

The outcomes of XRD and SEM copy of soil samples gained are set in table.

The XRD diffractograms are presented in next figure:



X-ray diffractograms of Sonavad soil series.



SEM pictures of Sonavad soil series sample detected at 1) 8.8 mm x 400, 2) x 1.00, 3) x 3.00, 4) x 11.0 5) x 35.0 k.

XRD Peak Intensity and Minerals			
Dominant	Medium	Weak	Trace
Wenkite	Kelyanite	Calderite	IMA-2009-016
Natron	Suessite	Buergerite	Nabiasite
Partlikite	Fencooperite	Glaucochroite	Bariosincosite
Almendine	Kolovratite	Metaborite	Laurite
—	Pizgrischite	Zoubekite	Miessiite

The mineralogical configuration of Sonavad soil series is noticed with reference to the d-spacing values gained from X-ray diffractograms with the standard d-spacing values. There are dominant minerals exist at Sonavad soil series are, Wenkite, Natron, Partlikite and Almendine at the distinguishing d-spacing values 3.4592, 3.01841, 3.39818 and 2.56829 Å^o respectively. The medium minerals exist at Sonavad soil series are Kelyanite, Suessite,

Fenicooperite, Kolovratite and Pizgrischite at the distinguishing d-spacing values 3.3014, 1.4063, 3.8902, 3.8854, 1.9576 Å respectively. The weak minerals appear at Sonavad soil series are Calderite, Buergerite, Glaucochroite, Metaborite, and Zoubekite at the resultant d-spacing values 1.5615, 2.5804, 1.85097, 4.4470 and 2.2323 Å respectively. The trace minerals exist at Sonavad soil series are IMA-2009-016, Nabiasite, Crafordite, Barriosincosite, Laurite and Miessite at the specific d-spacing values 3.1181, 2.3314, 2.17287, 2.01819, 1.6978 and 2.1974 Å correspondingly, shown from diffractograms presented in figure.

A characteristic soil sample of Sonavad soil series SEM pictures. The arrangements are decided with help of SEM images mentioned that maximum of the minerals images are scaly layered, blocky, and uneven shape [20, 28-30].

Conclusion:

Outcomes of soil examination are discussed and it is found that the method is relatively faster and more consistent in mineral examination of soil samples. The XRD results designate the occurrence of different minerals, specifically - Wenkite, Natron, Partlikite and Almandine, Kelyanite, Suessite, Fenicooperite, Kolovratite and Pizgrischite. From the above study, it is resolved that the different kinds of minerals exist in the Sonawad soil series.

SEM pictures mentioned that most of the minerals pictures are flaking layered, blocky, and irregular shape.

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