IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 08, Issue 7 (July. 2018), ||V (III) || PP 17-19

Determination of Physical Parameters and Metal Ions Concentration in Soil Samples around the Parva Village, Tq. Parbhani, Dist. Parbhani.

*Vilas Y.Sonawane *Department of Chemistry,
B.Raghunath Arts, Commerce and Science College, Parbhani, 431401, Maharashtra
Corresponding Author: Vilas Y.Sonawane

Abstract: The natural environment is clean, but due to multifarious activities of man, it gets polluted resulting in what is called environmental pollution. In the present study it was preferred to investigate the soil samples for its determination of various physical parameters and metal ion concentrations in soil various sample around Aland area Taluka Parbhani Dist. Parbhani. Soil sampling is the most vital step for any soil Analysis. As a very small fraction of the huge soil mass is used for analysis. This information will help farmers to decide the problems related to soil nutrients amount of fertilizers to be added to soil to make production economic. Six representative samples were collected and analyzed for its total alkalinity soluble carbonate and bicarbonates, Chloride, PH, Conductivity, Exchangeable Calcium and Magnesium. Chloride content was ranging from 0.05 to 1.98 g/100g, conductivity was ranging from 0.114 to 0.173micro ohms, the PH range from 8.36to 9.78 the value of exchangeable calcium and magnesium was found to be from 6.56 to8.96.

Keywords: Physicochemical, soil, analysis, Aland

Date of Submission: 28-06-2018 Date of acceptance: 13-07-2018

I. INTRODUCTION

The soil forms the intermediate zone between the atmosphere and the rock cover of the earth, the lithosphere. It also forms the interface between water bodies (hydrosphere) and the lithosphere and thus forming a part of biosphere. The soil may be defined as the uppermost weathered layer of the earth's crust in which are mixed organisms and products of their death and decay. It may also be defined as the part of the earth's crust in which plants are anchored. The soil is a complex organization being made up of some six constituents' namely inorganic matter, organic matter, soil organisms, soil moisture, and soil solution and soil air. Roughly, the soil contains 50-60% mineral matter, 25-35% water, 15-25% air and little percentage of organic matter (Chatwal et al, 2005). Soil pollution is caused by the addition of minerals to soils by man, from the use of agriculture chemicals such as herbicides, fungicides and insecticides, from the dust fall and precipitation and use of fertilizers and contaminated water. It is also caused by the industrial waste, agricultural waste, urban waste, biological pathogens, and radioactive waste. The industrial pollution increases the toxicity levels of the soil. The soluble salt given out as pollutants damages the cultivated farms.The soil pollution due to sewage is also very high. Several diseases are inflicted in human beings due to pathogenic forms present in the soil. It is the need of time that we have to study the physicochemical parameters of soil to know its quality. Fifteen representatives samples were collected from various parts of the city and its physicochemical analysis have been performed to know its different parameters like Color, alkalinity content, chloride, pH, conductivity, Exchangeable calcium and magnesium. Materials and water. Nitrogen is required for growth of plant and is a constituent of Chlorophyll, plant protein and it has fragile ecosystem [3, 4]. Soils are medium in which crop grows to food and cloth the world. Soil fertility [2]. Soil is important everyone either directly or indirectly. It is natural body on which agricultural product grow nutrients and water. Plants had elements for their growth and completion of life cycle. They are carbon, hydrogen, vital to a productive soil. Certain external factors control plant growth, air, temperature, light mechanical support, Soil samples of Aland village .The fertility of the soil depends on the concentration of N,P,K organic and inorganic oxygen, nitrogen, phosphorus, potassium, etc [5]. Helps in transfer of energy. Potassium is found in its mineral form and affect plants all division, carbohydrate much amount of nutrients is now recommended for addition to soil [6, 7].

II. MATERIAL AND METHODOLOGY

Six representative soil samples were collected in the depth of 0-12 cm from the surface of soil from different places of the Aland area in the year 2017.the soil were collected for analysis. The soil samples were preserved in polythene bags and further these samples kept in small jar for further analysis. The chemicals and reagents used for analysis were of A.R. grade from S.D Fine and Merck. Standard instrumental and non instrumental methods were used for estimation of the above mentioned parameters (R.M. Verma, 2000). The methods are as shown in the table 1.

Sr. No.	Parameter	Method
1	Color	By viewing
2	Texture	By viewing
3	PH	PH meter
4	Conductivity	Conductometry
5	Chloride	Volumetric method
6	Alkalinity Carbonates and Bicarbonates	Volumetric method
7	Exchangeable Calcium And Magnesium	Volumetric method

1) Color: By viewing.
2) Texture: By viewing
3) Test for PH

To determine the P^H at the moisture saturation percentage of soil, take 50g of 2-4mm soil in the beaker. Add small increments of distilled water without stirring the soil, till glistening layers appear on the surface of the soil. Now stir the soil with the help of glass rod to make a uniform pest. Take the P^H of unfiltered soil suspension. The limit of PH value for soil acidic, < 6.5, Normal 6.5-7.8, Alkaline 7.8-8.5, Alkali > 8.5.

4) Test for Electrical Conductivity

Prepare a 1:5 soil suspension by taking 20g of soil in a 100ml aerated distilled water. Shake mechanically for 1hour.Measure the conductivity of the soil suspension with conductivity meter by directly dipping cell in to the suspension.

5) Test for Chloride:

Prepare 1:5gm soil suspension by adding 100ml of distilled water to 20g of soil. Stir the mechanically for about 1 hour at regular intervals. Filter the suspension through Whatmann filter paper No.50 filter paper using Buchner funnel and vacuum pump. Determine the chloride content in the soil solution employing the method as describe for determination of chloride in the water.

6) Test for Total alkalinity, soluble carbonates and bicarbonates:

Prepare soil solutions as described in determination of soil chloride. Determine total alkalinity carbonates and bicarbonates in soil solution.

7) Test for Exchangeable calcium and magnesium:

Take air dried soil in 500ml beaker and add about 100ml of 40% alcohol, shake well and keep for 15minutes.Filter the suspension through Whatmann filter paper No.50 using Buchner funnel and vaccum pump. Wash the soil 4 to 5 times with 50ml portion of 40% alcohol. Perform the final washing with 50ml of absolute alcohol to dry the soil. Remove the filter paper and scrap the soil in a 250ml beaker. Filter the suspension and finally the soil with additional ammonium acetate through Whatmann No.42 filter paper using Buchner funnel and vacuum pump. Leach the soil 4 to 5 times more with portion of ammonium acetate and make up the final volume of the filtrate to 500ml in a volumetric flask. Take 50ml sample in a conical flask if the sample having higher alkalinity use smaller volume dilute to 50ml, add 2.0ml of NaOH solution in the sample. Add 100 to 200mg of murexide indicator a pink color develops, titrates against EDTA solution until the pink color changes to the purple color. For better judgment of the end point, compare the purple color with the distilled water blank titration end point.

III. RESULT AND DISCUSSION

The values of physicochemical parameters are presented in table 2. The color of soil sample was observed visually and it was found to be black for all the samples. Alkalinity is a measure of saline or salt effected soil, the pH of these soils is greater than 7. These soils occur most extensively in aired climates and as the city is aired the alkalinity value is ranging from 2.5 to4.02 meq/100gm. Chloride in the soil samples was found by titration method, the chloride content was very variable at all the places, it ranged from 0.051 to 0.106 g/100gm. pH of the soil sample ranged from 8.36 to 9.78. The values of pH showed that they lie in the alkaline side of the pH scale. Many workers have reported the values of pH in their investigations. The value of

conductivity is lying within the range of 0.114to 0.159 ohms. The conductivity values can vary with the chemical properties of soil, if the soil is contaminated by chemicals or if it is saline, the depth of soil sample. Z. Chik (2011) studied the chemical effects on soil compaction characterizations through electrical conductivity. He showed that if the soil is more acidic it shows electric conductivity value very high. The exchangeable calcium and magnesium percentage ranges from 0.131to0.179.

Table 01 – Study of Presence of color, Texture, PH, EC, Chloride and alkalinity in soil of Aland area ,Taluka Parbhani

Sr.No.	Sample ID	Color	Texture	PH	EC	Chloride	Alkalinity
1	Shekh Katthu	Black	Smooth	8.73	0.148	0.053	2.51
2	Pathan Maheboob	Black	Smooth	9.78	0.162	0.078	3.12
3	Shekh Rahim	Black	Rough	8.83	0.134	0.106	3.56
4	Shekh Imam	Black	Rough	8.38	0.139	0.076	4.05
5	Shekh Hasan	Black	Rough	9.09	0.118	0.088	4.39
6	Tekale Vasant	Black	Smooth	8.79	0.179	0.069	3.48

Table 02- Study of Presence of Ca, Mg, K in soil of Aland area, Taluka Parbhani

Sr. No.	Sample ID	Ca	Mg	K
1	Shekh Katthu	0.136	0.139	719
2	Pathan Maheboob	0.155	0.160	158
3	Shekh Rahim	0.147	0.149	439
4	Shekh Imam	0.179	0.195	348
5	Shekh Hasan	0.119	0.135	169
6	Tekale Vasant	0.162	0.175	162

IV. CONCLUSION

The soil samples were collected from the Aland area these samples are favorable for the crops.

Extension: The finding of this project was discussed with farmers of Aland area and to improve soil health recommendation were suggested as follows.

V. RECOMMENDATION

1) To reduce the P^H of the soil sample by addition of acidic radicals
2) To improve the quality of soil sample by taking the guidance of Vasantrao Naik Marathwada Krushi Vidyapeeth, Parbhani.
3) To communicate with the farmers about to increase the production various crops

ACKNOWLEDGEMENT

The author is very much thankful to the Management of B.Raghunath Arts, Commerce and Science College, Parbhani for permission to work of project in department of chemistry and Dr.Arshia Parveen for valuable guidance for completion of project.

REFERENCES

[1]. L Jaishree; Somwanshi; SK Akuskarint; Int.J.chem.Sci.**2008**, 6(1), 255-261.
[2]. K Kanimozhi; A Panneerselvam; Archives of Applied Science Research. 2011, 3 (2), 525-536.
[3]. AK Gupta; MLVarshaney; Practical Manual for Agricultural Chemistry. Kalyani Publisher, 1994, 3-26.
[4]. NN Garba; A.Isma'lla; UK Asma; ZN Garba; B.I Tijjni,; European Journal of Applied Engineering and Scientific Research., 2013, 2 (2), 23-27.
[5]. KP Kordlaghari; SN Sisakht; A. Saleh; Annals of Biological Research., 2013, 4 (3), 105-108.
[6]. KK Borah;, B.Bhuyan; HP Sharma; Archives of Applied Science Research., 2009, 1 (2), 159-164.
[7]. I.Ifenna; LC.Osuji; Archives of Applied Science Research.,2013, 5 (3), 184-192.
[8]. AF Aiyesanmi; AE Okoronkwo,; OM Sunday; Archives of Applied Science Research,, 2012, 4 (1), 360-371.
[9]. M C Onojake; LC Osuji; Archives of Applied Science Research. 2012, 4 (1), 8-58.
[10]. CC Trasar; MC Leiros; S Seoane; F. Gilsotres; Soil Biol. Biochem., 2008, 1, 301-307.

Vilas Y.Sonawane "Determination of Physical Parameters and Metal Ions Concentration in Soil Samples around the Parva Village, Tq. Parbhani, Dist. Parbhani.." IOSR Journal of Engineering (IOSRJEN), vol. 08, no. 7, 2018, pp. 17-19.