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Spatial diversity of oxides in soil affecting ceramics in Babil Governorate

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ABSTRACT

The current research dealt with the study of the Spatial variation of oxides in Babylon province. The research dealt with studying and conducting an XRF examination of twenty different regions of the Babylon province regions, and they were oxides and ten elements are: (U, ZrO_2, SrO, NiO, Cr_2O_3, V_2O_5, TiO_2, Cl, P_2O_5, ZnO) It was taken from the north, south, east and west of Babylon province, It turned out that there is a difference in the proportions from one region to another

Key words : *Spatial diversity of oxides, Ceramics, Babil, Iraq*

Introduction

The soil is the fragile or fragmented surface layer that covers the surface of the earth, which consists of crumbs of rock and grains of minerals resulting from the fragmentation and dissolution of rocks, as well as oxides and carbonates (Brown, 1998). Terra Rossa, which is originally derived from limestone rocks, and its color is due to the red presence of iron oxides in its components. As for the yellow soil approved, its color is due to the presence of hydrated iron oxides.Also, the oxides have an important role in the thermal properties of the Fatyanite clay. They are considered one of the high-temperature clays because they contain aluminium oxide and a small percentage of iron oxides and dirt bases. The red clays have a low melting point because they contain red iron oxide fe203 and titanium oxide (TiO_2). (Thus, oxides play an important role in the soil (Grim, 1968). Clays are known as aluminum aqueous silicate consisting of a four-faceted silica bond called a trihydrate with layers of eight-sided gypsite called bi-octahydra or with layers of eight-faceted brussite. Also, it is a triple octahydra and a mixture of other ions inside it in the structural composition and the soil is a natural substance resulting from the physical and chemical erosion of the Earth's crust rocks (Bates, Robert, 1969). The materials that make up the original crust of the earth, or what is called the lithosphere, and according to its composition are divided into three groups, which are igneous rocks, metamorphic rocks, and sedimentary rocks. The upper part of the lithosphere on the surface of the land is the soil. The active metallic and colloidal part of the soil is among the organic matter that predominates in soils in hot, rainy areas and oxides that predominate in soils in cold, rainy areas while clay minerals predominate in soils in arid and semi-arid regions (Meunier, 2005). Especially in Iraqi soil as a result of the availability of base ions, which are ionic components of an appropriate nature for the presence of such colloids that are activated under the reaction of soil PH tilting to the base and often we find clays loaded with organic and other mineral

materials such as iron oxides that affect the purity of clay and the quantity and quality of these impurities vary from Gilogi site to another according to the stages of clay formation and the places that it moves to in addition to the presence of these oxides in the form of primary minerals or water oxides that fall within the crystal network of clay minerals that have an impact on soil properties (Jassim and Goff, 2006).

Spatial variability is the variability of particular traits when it is distributed. It takes a certain value at every point X of the field in space it is called the two-dimensional Regionalized Variable or three dimensions of an expected value of the random variable (trait) according to a specific area that distinguishes the difference between the predictive and real value is called the Variogram Function. Oxides are important materials because they have an effect on clays and its effect on adsorption and Fixation processes and soil properties of density, porosity, texture and absorption, and therefore the natural effect on the type and nature of the soil whether it is rough, medium or smooth depends on the type and amount of oxides that make up the soil separates and their texture (Fanning *et al.,* 1989).

Materials and Methods

Soil samples were taken for different locations according to the manual drilling, and the complete elemental analysis of the proportions of oxides and elements in the samples was done by an X-ray crystal device (XRF) in the German laboratory of the Faculty of Earth Sciences - University of Baghdad, by each sample in the milling and pressed in the form of a circular disk in diameter (3) cm and then examined by the device.

Results

The results for ZnO were the highest in the sample (1, 2, 3, 7, 9, 11, 14, 16) and the lowest in the sample (8, 10, 13, 17, 18, 19, 20). As for oxide, The P_2O_5 phosphorous results were the highest in the sample (3, 1, 5, 8, 9, 10, 12, 13, 14, 15, 16, 17, 19) and the lowest percentages were in the sample (2, 4, 6, 7, 11 , 18, 20) As for Cl, the highest proportions were in the sample (8, 10, 11, 18) and the rest of the percentages were approximately equal, As for TiO_2, the samples were almost high in all samples, ranging between (1.5 and 1.7). As for P_2O_5, the percentages were low in all samples and close, whereas Cr_2O_3 was conver-

Ratio of oxides in 20 different places of Babil Governorate

	ZnO%	P_2O_5	CI	TiO_2	V_2O_5	Cr_2O_3	NiO	SrO	ZrO_2	U
1.	1.00900	1.1110	1.030	1.6690	1.01767	1.02833	1.02167	1.03233	1.01433	1.000400
2.	1.00900	1.0990	1.026	1.5890	1.01633	1.02233	1.02367	1.03567	1.01233	1.000400
3.	1.009667	1.1390	1.027	1.6103	1.01300	1.02100	1.02033	1.03367	1.01167	1.000400
4.	1.008333	1.1097	1.026	1.5823	1.01433	1.03633	1.02100	1.03167	1.01167	1.000400
5.	1.008333	1.1157	1.015	1.6530	1.01567	1.02633	1.02100	1.03300	1.01167	1.000400
6.	1.008333	1.1090	1.032	1.6030	1.01633	1.02567	1.02100	1.03833	1.01167	1.000800
7.	1.009000	1.1097	1.020	1.6030	1.01500	1.03300	1.02233	1.03167	1.01167	1.000400
8.	1.007667	1.1117	2.780	1.6077	1.01433	1.02367	1.01900	1.03567	1.01233	1.000867
9.	1.009000	1.1130	1.023	1.5837	1.01300	1.04700	1.02100	1.03833	1.01167	1.000400
10.	1.007000	1.1183	1.118	1.6623	1.01433	1.02567	1.01767	1.03167	1.01100	1.000400
11.	1.009000	1.1050	1.015	1.5883	1.01633	1.02567	1.02367	1.03233	1.01100	1.000380
12.	1.008333	1.1283	1.020	1.6177	1.01433	1.02567	1.01900	1.03433	1.01233	1.000400
13.	1.007667	1.1150	1.008	1.6330	1.01633	1.02833	1.01967	1.03033	1.01167	1.000373
14.	1.009000	1.1210	1.016	1.6070	1.01567	1.02300	1.02100	1.03567	1.01167	1.000360
15.	1.008333	1.1270	1.187	1.6590	1.01767	1.02700	1.02233	1.03100	1.01233	1.000400
16.	1.009000	1.1130	1.024	1.6083	1.01767	1.02300	1.02233	1.03433	1.01167	1.000800
17.	1.007667	1.1197	1.095	1.7197	1.01233	1.03433	1.01900	1.03167	1.01367	1.000400
18.	1.007667	1.1030	1.311	1.6290	1.01500	1.02700	1.02100	1.03300	1.01100	1.000400
19.	1.007000	1.1130	1.014	1.7037	1.01167	1.03567	1.01900	1.03033	1.01367	1.000373
20.	1.007000	1.0977	1.022	1.6083	1.01167	1.03433	1.01900	1.3433	1.01167	1.000400
L.S.D 0.05	0.0011	0.0142	0.5628	0.0559	0.0027	0.0093	0.0023	0.0033	0.0012	0.0002

gent to the results, V_2O_5, and also for NiO, SrO, and ZrO_2. As for uranium, its percentage in all samples ranged between (1.0004 (and (1,000,000)), which is very convergent.

Discussion

The difference in the percentage in the oxides of the samples through the results appears the difference is not much, perhaps due to the nature of the soil and the homogeneity of the samples due to the fact that they are sedimentary soils of recent formation that are similar in many traits and the way they are formed, because rain does not fall significantly in the central region, this may affect the soil They are not exposed to strong weathering agents and therefore the proportions of the oxides are convergent to the samples. The nature of the soils formed in dry to semi-dry climatic conditions. The variation in concentrations depends mainly on the content of the samples from the minerals, taking into consideration the type of source rocks for these soils which were taken from the area. And it appears that the quality of minerals in these samples plays the main role in determining the percentage of the mica and illite minerals, as the soil texture plays a significant role in this field (Haydnh, Murray, 2007). As the percentage increase and decrease on the diversity of clay, silt, sand or loam soils, the gypsum salts also play a role in the percentage of oxides as well as the ion exchange capacity of minerals in the soil as well as the impact of groundwater, whether with a negative or positive effect, and the alluvial soils sample may be newly formed, which are similar in many properties and their five formation factors, Where they dominate almost uniformly in the effect and processes of physical, chemical and biological weathering, especially in the soils of central and southern Euphrates (Borchardt and Smectites, 1989).

Conclusion

1. The percentage of oxides that there were examined by the soil sample under study is considered to be a few percentages.
2. The oxides in question are considered to have convergent proportions.
3. The TiO_2 ratio achieved the highest percentage of sample oxides.
4. The lowest percentage of uranium (U).

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