

CLAY MINERALS IDENTIFICATION IN SOME IRAQI SOILS

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M.Sc. 1984

Clay fraction is the most important reactive mineral component of the soil. The physical and chemical properties of soils which affect plant growth are governed to a great extent by the clay minerals properties in these soils. Thus through knowledge regarding clay mineralogy of agriculture soils, it will be possible to understand and manage soils for profitable farming which Iraq is no exception.

Information on the clay mineralogy of Iraqi soils is not only limited but also scattered and imperfect in many cases. There are indications, that Iraqi soils contain a clay mineral which behaves like montmorillonite, vermiculite, and chlorite in x-ray diffraction analysis.

The aim of this work was to furnish information about the nature of clay mineralogy of some Iraqi soils and to identify clay mineral with character between montmorillonite, vermiculite and chlorite.

As no single method is perfect in clay mineralogy studies, a combination of techniques were used, these are: XRDA, E.M, DTA, and chemical analysis.

Three soils with dominant 14 A clay minerals showing behavior between montmorillonite, vermiculite and chlorite were chosen. These soils are: Chromoxerert soil from Faida in Dohuk governorate, Torrifluent soil third was also Torrifluent from Adaim in Diyala governorate. Samples from different horizons of each pedon was taken. Each sample was separated to six fractions. They were: fine clay, coarse clay, fine silt, medium silt, coarse silt and sand.

Results can be summarized as follows:

Smectite is the dominant clay mineral in fine fractions, and chlorite is the dominant in the coarse fractions. Fine clay was dominated by smectite, followed by hydrous mica, palygorskite, kaolinite, with trace amount of chlorite and sometimes stratified smectite-mica. Coarse clay composed of smectite, hydrous mica, kaolinite and trace amount of stratified smectite-mica. Fine silt was dominated by smectite, followed by chlorite, hydrous mica, kaolinite and trace amount of vermiculite. While medium and coarse silt was composed of chlorite, hydrous mica, kaolinite with trace amount of smectite

and vermiculite. Sand was composed of chlorite, hydrous mica, kaolinite and trace amount of vermiculite.

Swelling behavior after solvation with vapor glycerol and glycol, Green-Kelly test and DTA proved that the smectite mineral present in these soils was of Beidellitic type.