

Turkish Journal of Agriculture and Forestry

Turkish Journal

of

Agriculture and Forestry

The Genesis of Smectite and Palygorskite on Harran Plain's Soil Series

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Abstract: This investigation was conducted for the determination of the sources of palygorskite and smectite minerals found widely in large proportions in soil series on Harran Plain. Various methods were used for isolating smectite and palygorskite minerals. While palygorskite and smectite were not successfully separated soil samples, separation was achieved in Fatik limestone residue. While the length of palygorskite minerals was found to be 1.00-2.75 μm and the width 0.10-0.20 μm in limestone, the length and width of palygorskite minerals were found to be about 0.20-0.75 μm and 0.075 μm , respectively, in soil samples. While Fatik limestone residue had a strong endothermic reaction at 170-210 $^{\circ}\text{C}$, soil samples reacted only slightly at 150 $^{\circ}\text{C}$ only. Even though chemical analysis indicated that they were similar, DTA electron microscope data showed that palygorskite obtained from soil samples was structurally different from palygorskite obtained from residue. In light of the above data, it was determined that palygorskite from limestone was unstable in saline settling surrounding and dissolved in soil conditions and formed stable palygorskite in the present conditions.

Turk. J. Agric. For., **23**, (1999), 635-642.

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