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Contributions to the study of organic-mineral complexes from hortic anthrosols

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In this paper are presented the preliminary results of studies concerning the composition, structure and stability of organic-mineral complexes from hortic anthrosols. The separation of organic-mineral complexes has been performing by isodynamic magnetic method and by extraction in aqueous Na2SO4 –polyethylene glycol two-phase systems. The composition and structure of organic-mineral complexes have been studied by Raman, FT-IR and UV-VIS spectroscopy, optic microscopy, thermal and chemical analysis. In studied horthic antrosol, the content of organic-mineral complexes varied between 20.42-48.36 % [w/w], being evidenced a relative accumulation tendency in Ahok (48.36 %) horizon and in grain size fractions < 0.002 mm (63.62-86.30 %, from total determined organic-mineral complexes), respectively. The maximum weight (29.45-64.56 %) has been observed at grain size fractions < 0.001 mm. The high apparition frequencies and stability have organic-mineral complexes which include in their structures predominantly, the amorphous forms of clay minerals and of iron oxi-hydroxides. In function of clay mineral type from organic-mineral complexes composition, have been observed that the apparition frequency and stability follow the order: smectite > illite >> kaolinite (have been evidenced a special stabilization effect in case of Ca and Mg forms of clay minerals). In function of iron oxi-hydroxides type from organic-mineral complexes composition, has been observed that the apparition frequency and the stability follow the order: Fe(OH)3 (amorphous) > Fe(OH)3 (ferihidrite, amorphous) > □ -FeO(OH).nH2O (lepidocrocite) > □ -FeO(OH).nH2O (göethite) > □ -Fe2O3 (hematite). The separated and studied organic-mineral complexes have very complex compositions and structures (generally have 4- 5 structure levels), include over 65 % from mineral and organic components of anthrosol and are behaves as supra-molecular assembles very stable and with a high chemical-structural flexibility degree. In function of chemicalmineralogical composition and of their structure, the organic-mineral complexes from studied anthrosol have been classified in four main classes.