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Role of alkaline magmatism in the formation of fluorite in Central Anatolia

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Fluorite generally has three different types of formation, in relation to the hydrothermal fluids of silica undersaturated alkaline magmatism in Central Anatolia. The reaction between fluorine rich fluids and calcium of carbonate rocks at the contact of alkaline rocks act in the formation of the fluorite in the region. Silica undersaturated intrusive can be used as an indications of fluorite occurrences in the explorations of these minerals in the region. Central Anatolia is the unique region where fluorite bearing silica undersaturated alkaline intrusives (foid bearing syenitic rocks) are widely observed. These rocks have outcrops near Kırşehir (Bayındır, Yenyapan, İshocalı, Alişar, Tatarilyas, Çökelik, Akçakent, Pöhrenk), Yozgat (Akdağmadeni, Cankılı, Tad Dere, Ortaköy, Akçakışla), Nevşehir (Genezin-İdişdağ), Kayseri (Özvatan) and Sivas (Yaylagözü) cities. Fluorites are formed in the form of lenses, fracture and vein fillings in relation to the hydrothermal fluids of silica undersaturated alkaline magmatism. Apart from these localities, Pöhrenk is the only locality where fluorites are observed as open space fillings within the carbonate rocks. The deposits around Kırşehir have lower homogenization temperatures and salinity values than the deposits around Yozgat and Sivas region. In accordance, the fluorite occurrences in Pöhrenk are sedimentary in nature whereas other deposits are hydrothermal and pegmatitic in nature. The geological, mineralogical and geochemical features of the alkaline rocks and the fluorite reveal that the fluorine rich fluids are generated from the late residual products of the alkaline magma and act with the Ca rich products forming the fluorite depositions within the host rock in Central Anatolia.

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