
Flint Clay and a Flint-Clay Facies

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Abstract: Flint clay is defined as a sedimentary, microcrystalline to crystalline clay (rock) composed dominantly of kaolin, which breaks with a pronounced conchoidal fracture and resists slaking in water. Additional ceramic (refractory) properties are implied, but not expressed, in the definition. Flint clay first given recognition in the U.S.A., has been observed on all continents; it will probably be found to be more abundant than its occurrences reported to date. It occurs in rocks mainly Carboniferous or Cretaceous in age, and is invariably associated with plant- or coal-bearing measures.

The environment of deposition is commonly lowlying paludal, in basins in either clastic silicate rocks or in karstic carbonates. It is inferred that parent illitic and/or kaolinitic clay colloids were transported into the swamps and there under-went further dialysis, alteration, and eventual crystallization *in situ*, producing a notably homogeneous kaolinite clay possessing interlocking crystallinity. Some occurrences were further desilicated to high-alumina minerals, particularly to diaspore and boehmite.

Flint clay is interpreted as being an intermediate member of a so-called flint-clay facies which is a claystone sequence ranging from high-alumina minerals (or potentially so) formed on the highest part, structurally and/or topographically, of the depositional area, and grading down-structure and/or lower in elevation through flint clay to illite-kaolinite plastic clay and thence to marine illitic shale, all being equivalent stratigraphically. The geochemical reactions are depotassification of parent clay by substitution of K^+ by H^+ , and desilication, especially where high-alumina minerals are formed.

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