
Goyazite in Kaolinitic Altered Tuff Beds of Cretaceous Age Near Denver, Colorado

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Abstract: A hydrated aluminophosphate mineral was identified in thin, kaolinitic clay beds of the Cretaceous Dakota Group and the overlying Mowry Shale in the Dakota hogback west of Denver, Colorado. It occurs as 1–3- μm size euhedral crystals and makes up as much as 15% of the rock. Sr is by far the dominant divalent cation present, ranging from 9.4 to 13.1%, confirming the X-ray powder diffraction identification of this mineral as goyazite, the Sr member of the plumbogummite group. The characteristic pseudo-cubic, rhombohedral morphology of this mineral is plainly visible in scanning electron micrographs. On the basis of its euhedral morphology and its occurrence in volcanic ash-derived kaolin beds, the goyazite probably formed during early diagenesis, before or during the alteration of the ash, and before much compaction of the beds.

Key Words: Diagenesis • Goyazite • Kaolinite • Phosphorus • Volcanic ash

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