Natroalunite in a Laterite Profile Over Deccan Trap Basalts at Matanumad, Kutch, India

D. V. Chitale and N. Güven

Department of Geoscience, Texas Tech University Lubbock, Texas 79409

Abstract: An end-member natroalunite of composition $(K_{0.04}Na_{0.96})(Al_{2.98}Fe_{0.02})(SO_4)_2(OH)_6$ occurs in saprolitic clays in a laterite profile developed over Deccan Trap basalts at Matanumad in the Kutch region of Gujarath state, India. Pseudocubic natroalunite crystals, ranging from 0.5 to 1 μm in size, have replaced pseudohexagonal, 2-μm-size platelets of kaolinite. The reverse reaction (kaolinization of natroalunite) has also been observed in the laterites and bauxites immediately adjacent to the saprolite. The kaolinite crystallites that replaced natroalunite occur as a mosaic of anhedral platelets that range in size from 0.1 to 0.3 μm. The formation of natroalunite at Matanumad postdates the laterization of the basalts. It is related to the post-diagenetic formation of sulfuric acid-rich solutions by the oxidation of pyrite in the Eocene-Oligocene black shales of the Matanumad basin. The kaolinitic clays at the top of the saprolite zone have been intensely altered by the acidic solutions, leading to a high concentration of natroalunite.

Key Words: Alunite • Kaolinite • Laterite • Natroalunite • Oxidation • Saprolite

Clays and Clay Minerals; June 1987 v. 35; no. 3; p. 196-202; DOI: 10.1346/CCMN.1987.0350305

Clay Minerals Society (www.clays.org)