

Clay (Ceramic) mineral resources of Pakistan: Recent advances in discoveries

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Abstract

The various clay rocks are found in various ages ranging from Precambrian to recent. China clay/Kaolin deposits are found in Shah Dheri Swat (2.8mt), Nagar Parkar (3.6mt) and Islamkot (20mt) Sindh. Smaller deposits are found from Dir, Hazara (Ahl) and Gilgit also. Fuller's earth/Bentonite is nonplastic clay usually contain appreciable magnesia and valued for its decolorizing and purifying properties. It is found in Kahan and Chamalang (Ghazij) groups, Potwar/Vihowa/Manchar Group and alluvial flood plain deposits in Sulaiman basin and Hazara slates in Kohala area. Bentonite is being mined from Attock, Salt Range and Mir Pur-Bhimbar areas. Thin beds (upto few cms only) of bentonite are known from Upper Indus Basin like Qadirpur-Bhilmor and Bhadrhar in central Salt range, from Rohtas-Dariala in eastern Salt range, Bhimber-Mawa Kaneli and Samwal-Pothi-Karota in foothills of Azad Kashmir. Present authors have also found bentonite (10,000 million tons/mt) in Quaternary alluvium of Dheri Chohan, Dheri Laghal and Shenbagh village and surrounding areas located on the southern vicinity of Attock town area (Kala-Chita Range) where now mining is stopped. Thick immense reserves of fuller's earth are found in Domanda and Baska formations in eastern Sulaiman foldbelt. The main producers are D.G.Khan (Punjab), Thano Bulla Khan (Dadu district) and Shadi Shahid (Khairpur) and Bhimbar-Mir Pur (Azad Kashmir). With activation this clay may be used in vegetable oil and ghee industries. It is also being used in insecticide, foundries and steel industries. It is being produced from Punjab, Sindh, Khyber Pakhtunkhwa and Azad Kashmir. In Punjab the main producer of Fuller's earth is the D.G.Khan, Thano Bulla Khan (Dadu district) and Shadi Shahid (Khairpur). One thick bed (1.5m) of fuller earth reported on the contact of Litra and Chaudhwan formations in the eastern limb of Zinda Pir anticline (Taunsa area, D.G.Khan) which contains quartz, microcline feldspar, calcite and ilite. It is resistant and form prominent escarpment/cliff with yellow limonitic staining. Further recently, Malkani collected samples of fuller's earth from Domanda and Drazinda shales of western (Zin area) and eastern limb (Mahoi area) of Zinda Pair anticline, Tehsil Taunsa, Dera Ghazi Khan District and their chemical results show SiO₂ 50.86 to 64.01%, Al₂O₃ 9.79 to 17.18%, Fe₂O₃ 3.10 to 6.89%, CaO 6.41 to 12.20%, MgO 2.01 to 5.64%, P₂O₅ nil and loss on ignition/volatiles 8.87 to 12.60%. Present author estimated reserves of 10mt upto 200 meter easily mineable depth in Zinda Pir anticline areas. Huge reserves of fuller's earth are observed in Domanda, Drazinda and Baska formations in eastern Sulaiman Range. The present research shows its existence from Dera Bugti-Rajan Pur-D.G.Khan-Musakhel-D.I.Khan and Barkhan-Kohlu districts. The deposits upto easily mineable depths 200 meter are estimated about 1billion ton from eastern Sulaiman foldbelt. Fire clay beds generally associated with coal seams are found in Mianwali, Sargodha and Attock districts. Fire Clay is resistant to shrinkage, abrasion and corrosion under high temperatures and low in iron and high in silica. Its main producers are Mianwali, Sargodha and Attock districts. It is also found from Dadu and Paniala of D.I.Khan districts. These are residual sedimentary deposits generally found at the base of Paleocene Patala, Eocene Sohnari beds. The fire clay deposits are also found in Chitarwata, Rakhi Gaj, Baska, Domanda and Drazinda formations and Vihowa group of eastern Sulaiman foldbelt. The bentonite is found in Kohala (Hazara slates) and in Karak areas.