

Quantification of Non-Crystalline Material in Bauxites

William Gregorio Meléndez (wmelende@strix.ciens.ucv.ve),
Luisa Margarita Rodríguez (luisamaroma@hotmail.com) & Armando José Ramírez
(aramirez@strix.ciens.ucv.ve)

Instituto de Ciencias de la Tierra, Facultad de Ciencias, Universidad Central de Venezuela, Caracas, Apdo.
3895, 1010-A, Venezuela

A selective chemical dissolution method using Tiron (1,2-Dihydroxybenzene-3,5-disulfonic acid disodium salt) [1], has been used to quantify Al, Fe, Si and Ti in non-crystalline material in bauxites. The extraction was performed with 50 mg sample, 30 ml Tiron buffered at pH 10.5, heated at 80 °C during 2 hours and extract was analysed by ICP-AES. The results obtained for quartz, kaolinite, opal, silica gel and the amorphous iron oxyhydroxides showed that the silica gel and amorphous iron oxyhydroxides were extracted in more than 95% and the crystalline material showed negligible dissolution. The results obtained for the bauxite's samples indicated that the grain size fraction smaller than 43µm presented the highest concentration of Al₂O₃ [0.55 -

11.36]%, Fe₂O₃ [0.19 - 3.89]%, SiO₂ [0.15 - 0.53]% and TiO₂ [0.001 - 0.08]% associated with amorphous material. The data for two (19-m and 37-m) bauxitic profiles showed that Al₂O₃ [0.3 - 4.9]%, Fe₂O₃ [0.02 - 1.30]% and TiO₂ [0.001 - 0.07]% decrease with depth and SiO₂ [0.001 - 0.04]% tends to increase with depth. This was observed for the total sample as well for any given grain size fraction. The relative abundance of amorphous material found in the bauxitic samples in the silt-clay size fraction was Fe > Al > Ti >> Si.

Biermans V & Baert L, *Clay Minerals*, **12**, 127-135, (1977).