

Supplementary Materials: Mineralogical Appraisal of Bauxite Overburdens from Brazil

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Table S1. Chemistry (wt. %) of the studied representative Belterra Clay samples. The presented chemical compositions are the results of the major oxides analyzed by X-Ray Fluorescence spectroscopy (XRF), and stoichiometric calculated from the Rietveld-XRPD mineralogical quantification. Loss on Ignition = LOI. MgO, Na₂O and P₂O₅ were measured but are not displayed in the table, because they are absent according to XRF.

Sample	Method	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	TiO ₂	MnO	CaO	K ₂ O	LOI
BRA 0.5m	XRF	36.81	34.97	10.58	1.78	0.03	0.03	0.04	15.39
	Calculated from Rietveld-XRPD	37.86	35.13	10.28	2.10	-	-	-	13.44
BRA 13m	XRF	35.66	35.58	11.27	2.17	0.03	0.00	0.03	14.86
	Calculated from Rietveld-XRPD	35.00	35.42	12.42	2.15	-	-	-	13.63
CIR 0.5m	XRF	32.49	37.60	10.47	1.90	-	0.04	0.04	17.13
	Calculated from Rietveld-XRPD	32.77	37.82	10.43	2.10	-	-	-	15.34
CIR 14m	XRF	28.88	39.76	11.12	2.17	0.03	0.00	0.00	17.64
	Calculated from Rietveld-XRPD	28.09	39.63	12.14	2.25	-	-	-	16.81

Table S2. Mineralogical composition of the studied representative Belterra Clay samples after the Rietveld-XRPD quantifications. Rwp: R-weighted profile; GOF: goodness of fit.

Phase/Sample	BRA 0.5m	BRA 13m	CIR 0.5m	CIR 14m
kaolinite	76.6	74	67.6	60.4
gibbsite	3.2	4.4	11.8	19.2
goethite	14.8	15.5	15.9	15.1
hematite	-	2.3	-	2.2
anatase	2.1	2.2	2.1	2.3
quartz	2.2	0.6	1.3	-
amorphous	0.9	1.2	1.5	0.9
Rwp	1.8	5.9	5.7	5.5
GOF	6.2	1.8	1.7	1.6