Figure S1: XRD pattern of OreA (a), OreB (b) and OreC (c) with the particle size fraction < 63 µm portrait in black and the size fraction (63-125) µm in red

Table S1: Linear regression results of model fitting approach for thermal goethite decomposition (fraction < 63 µm)

	OreB						OreC					
	Heating Rate [K/min]						Heating Rate [K/min]					
	1		2		5		1		2		5	
Model	I	II	I	II	I	II	I	II	I	II	I	II
P1	0.5166	-	0.5607	-	0.6059	-	0.7082	-	0.6795	-	0.5169	-
P2	0.7538	-	0.7422	-	0.7650	-	0.8480	-	0.8110	-	0.6487	-
P3	0.8624	-	0.8397	-	0.8512	-	0.9112	-	0.8807	-	0.7408	-
P4	0.9272	0.8964	0.9068	0.9323	0.9117	0.9237	0.9504	-	0.9293	-	0.8214	-
A2	0.8973	0.8070	0.8791	0.8022	0.8884	0.7305	0.9476	0.3335	0.9498	0.6720	0.8647	0.5402
A3	0.8224	0.16713	0.8098	0.4053	0.8277	0.2221	0.9213	0.0092	0.9266	0.4947	0.8222	0.1183
A4	0.6573	0.6550	0.6800	0.1861	0.7155	0.3199	0.8699	0.4587	0.8855	0.2290	0.7604	0.1184
D1	0.9322	0.9332	0.9123	0.9536	0.9168	0.9478	0.9535	-	0.9334	-	0.8290	0.7092
D2	0.9374	0.9573	0.9191	**0.9687**	0.9234	**0.9568**	0.9604	0.7959	0.9465	**0.9299**	0.8544	**0.9050**
D3	0.9425	**0.9606**	0.9257	0.9613	0.9298	0.9430	**0.9657**	**0.8330**	0.9597	0.8798	0.8823	0.8746
R2	0.9260	0.9282	0.9069	0.9459	0.9125	0.9156	0.9565	0.1497	0.9454	0.7465	0.8520	0.5830
R3	0.9292	0.9350	0.9108	0.9408	0.9163	0.9104	0.9594	0.5858	0.9525	0.8042	0.8669	0.7436
F0	0.9157	0.6559	0.8942	0.8139	0.9002	0.7812	0.9433	-	0.9201	-	0.8047	-
F1	0.9351	0.9225	0.9185	0.9058	0.9237	0.8765	0.9627	0.6896	0.9640	0.7777	0.8947	0.7615
F2	0.9496	0.8561	0.9384	0.7832	0.9426	0.7606	0.9512	0.6528	**0.9733**	0.7064	0.9542	0.7083
F3	**0.9592**	0.8314	**0.9537**	0.7486	**0.9569**	0.7277	0.9184	0.6606	0.9541	0.7087	**0.9777**	0.7117

Table S2: Linear regression results of model fitting approach for hematite thermal decomposition (fraction < 63 µm)

	OreA			OreB			OreC		
	Heating Rate [K/min]			Heating Rate [K/min]			Heating Rate [K/min]		
Model	1	2	5	1	2	5	1	2	5
P1	0.7973	0.8438	0.8262	0.9054	0.8979	0.8902	0.8797	0.9289	0.8900
P2	0.8250	0.8597	0.8485	0.9158	0.9086	0.9010	0.8960	0.9401	0.9073
P3	0.8479	0.8735	0.8672	0.9246	0.9178	0.9104	0.9094	0.9490	0.9211
P4	0.8726	0.8892	0.8876	0.9345	0.9282	0.9211	0.9239	0.9582	0.9354
A2	0.9008	0.9154	0.9132	0.9657	0.9568	0.9522	0.9507	0.9800	0.9699
A3	0.8868	0.9066	0.9017	0.9620	0.9524	0.9476	0.9441	0.9769	0.9658
A4	0.8700	0.8966	0.8879	0.9578	0.9472	0.9424	0.9363	0.9732	0.9607
D1	0.8753	0.8910	0.8898	0.9356	0.9294	0.9223	0.9254	0.9592	0.9369
D2	0.8887	0.9027	0.9020	0.9469	0.9402	0.9342	0.9371	0.9680	0.9516
D3	0.9037	0.9151	0.9151	0.9596	0.9522	0.9470	0.9489	0.9768	0.9667
R2	0.8899	0.9048	0.9033	0.9515	0.9440	0.9384	0.9399	0.9709	0.9575
R3	0.8975	0.9110	0.9100	0.9576	0.9499	0.9446	0.9458	0.9752	0.9645
F0	0.8669	0.8855	0.8829	0.9322	0.9258	0.9186	0.9206	0.9561	0.9322
F1	0.9125	0.9230	0.9230	0.9689	0.9607	0.9562	0.9562	0.9825	**0.9734**
F2	0.9515	0.9535	0.9569	**0.9860**	**0.9805**	0.9786	**0.9734**	**0.9930**	0.9327
F3	**0.9766**	**0.9735**	**0.9793**	0.9747	0.9770	**0.9790**	0.9689	0.9878	0.8473

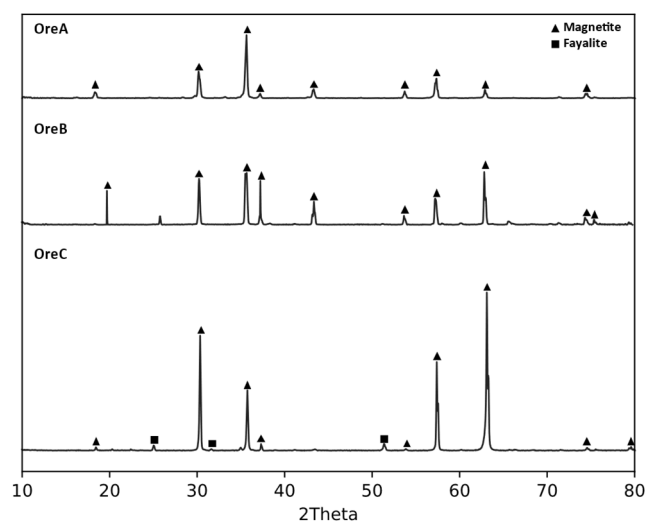*Figure S2: XRD patterns of cross-section of OreA, < 63 µm, heating rate of 2 K/min, OreB, < 63 µm, heating rate of 2 K/min and OreC, < 63 µm, heating rate of 5 K/min*