Analyysitulokset, Prizztech

Oulun yliopisto

Kestävän kemian tutkimusyksikkö

Janne Pesonen

Prizztech 5 kpl struviittinäyte. Suoritettiin seuraavat analyysit:
XRF
XRD
Alkuaineanalyysi (CHNS)
ICP-OES (haitta-aineet)

Alkuaineanalyysi

Näyte	C (%)	H (%)	N (%)	S (%)
Erä 5	10.58	3.76	4.52	0.18
Erä 12	9.32	3.43	1.12	0.0
Erä 13	12.15	3.93	2.21	0.37
Erä 13x	15.72	4.34	2.27	0.65
Struviitti, Berliini	0.21	0.0	3.95	0.0

ICP-OES

Näyte	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
Erä 5	1.91	0.13	8.18	71.6	1.75	9.3	107
Erä 12	0.83	<0.08	6.87	6.45	1.78	6.99	45.25
Erä 13	18.6	<0.08	7.11	4.07	8	8.03	74.8
Erä 13x	14.3	<0.08	4.92	4.4	5.88	8.1	18.6
Struviitti, Berliini	<0.42	<0.08	2.95	53.2	1.78	8.84	38.8

XRF

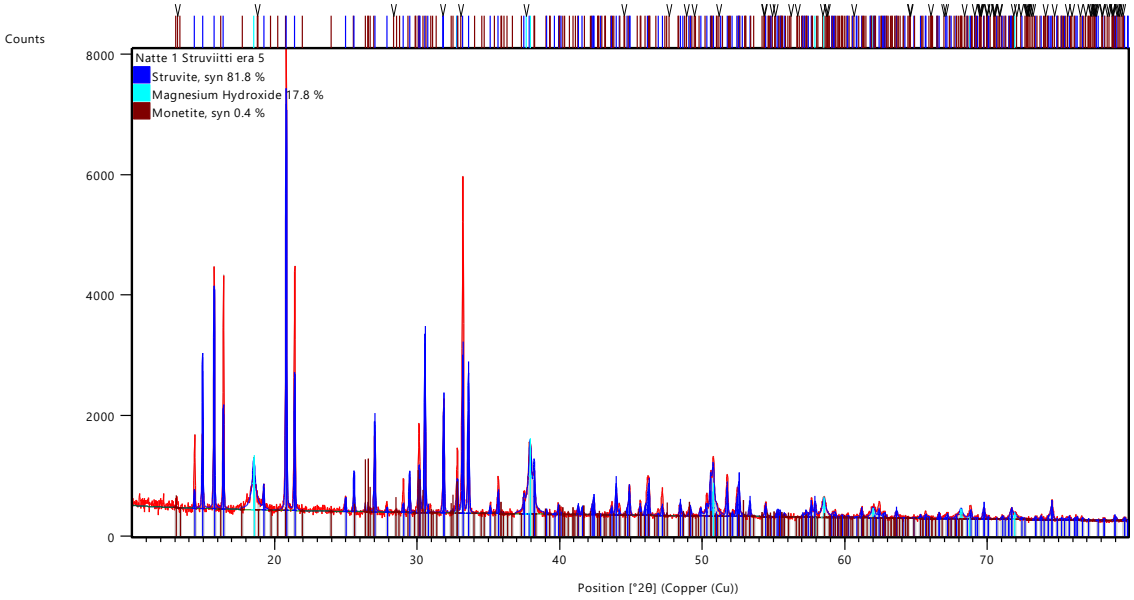
Näyte	MgO	Al_2O_3	SiO_2	P_2O_5	SO_3	K_2O	CaO	TiO_2	MnO	Fe_2O_3	NiO	CuO	ZnO	As_2O_3	BaO	Cl	Na_2O	PbO	Rb_2O	SrO	ZrO_2
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Erä 5	30.968	2.038	2.741	42.802	2.79	1.539	5.376	0.11	0.245	11.22	0.02	0.071	0.079								
Erä 12	27.151	0.753	6.645	30.371	0.6	2.322	23.256	0.062	0.385	8.006			0.042			0.408					
Erä 13	12.372	7.79	33.987	24.424	3.114	6.932	6.81	0.147	0.082	2.103	0.013		0.022	0.014	0.02	0.281	1.796	0.02	0.039	0.022	0.013
Erä 13x	11.745	7.227	33.472	24.396	4.756	6.997	6.279	0.146	0.079	1.873					0.017	0.528	2.415	0.017	0.035	0.018	
Struviitti, Berliini	14.241	1.295	35.318	40.346	1.765	0.634	3.237	0.183	0.134	2.727		0.014	0.02			0.071					0.016

XRF. Laskennallisesti struviitiksi määritettynä.

Näyte	Struviitti	Al_2O_3	SiO_2	P_2O_5	SO_3	K_2O	CaO	TiO_2	MnO	Fe_2O_3	NiO	CuO	ZnO	As_2O_3	BaO	Cl	Na_2O	PbO	Rb_2O	SrO	ZrO_2
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Erä 5	91.195	0.825	1.087	0.012	1.012	0.54	1.826	0.035	0.075	3.351	0.005	0.018	0.02								
Erä 12	84.22	0.331	2.893	0.008	0.253	0.929	8.644	0.019	0.117	2.404			0.011			0.17					
Erä 13	57.366	5.64	23.725	0.163	1.948	4.213	3.975	0.083	0.046	1.176	0.007		0.012	0.008	0.012	0.174	1.399	0.011	0.021	0.012	0.007
Erä 13x	55.457	5.352	23.964	0.536	3.053	4.357	3.767	0.085	0.046	1.082					0.01	0.335	1.917	0.009	0.02	0.01	
Struviitti, Berliini	64.133	0.899	23.83	6.261	1.01	0.357	1.807	0.1	0.072	1.464		0.007	0.01			0.041					0.009

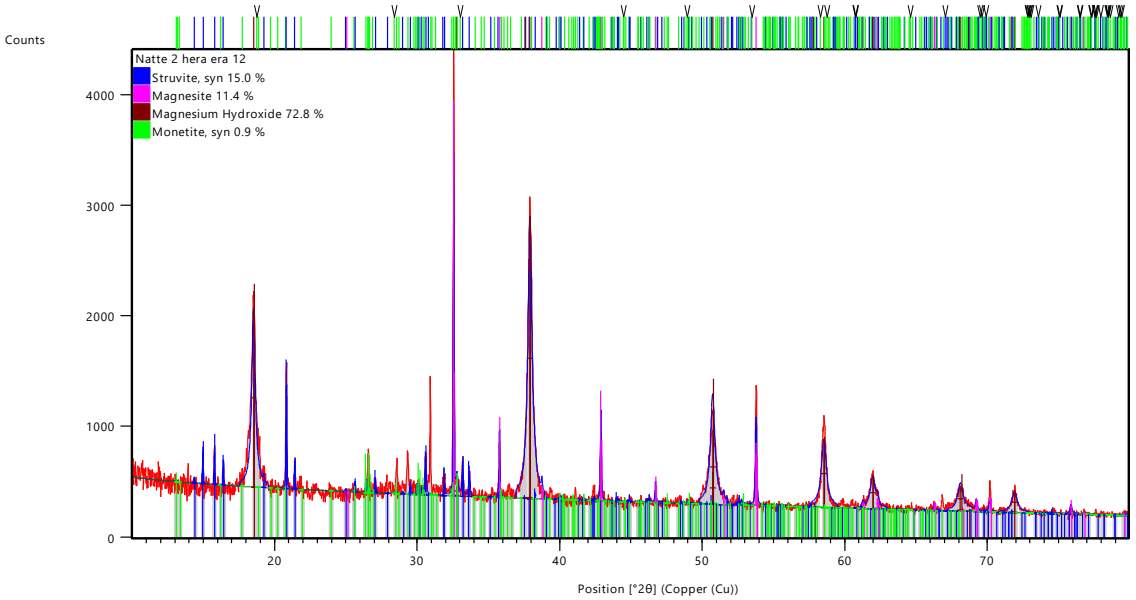
XRD

Erä 5



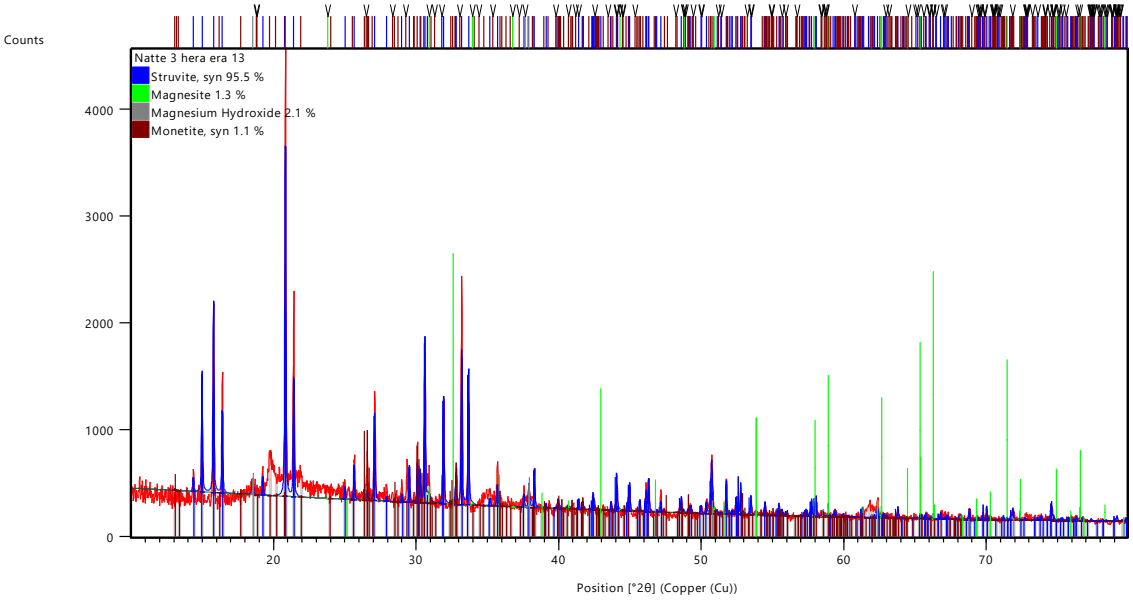
Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor	Chemical Formula
*	04-010-2894	47	Ammonium Magnesium Phosphate Hydrate	0.000	0.819	(N H4) Mg (P O4) (H2 O)6
*	04-015-9383	27	Magnesium Hydroxide	0.000	0.155	Mg (O H)2
*	04-009-6216	19	Hydrogen Calcium Phosphate	0.000	0.108	H Ca (P O4)

Erä 12



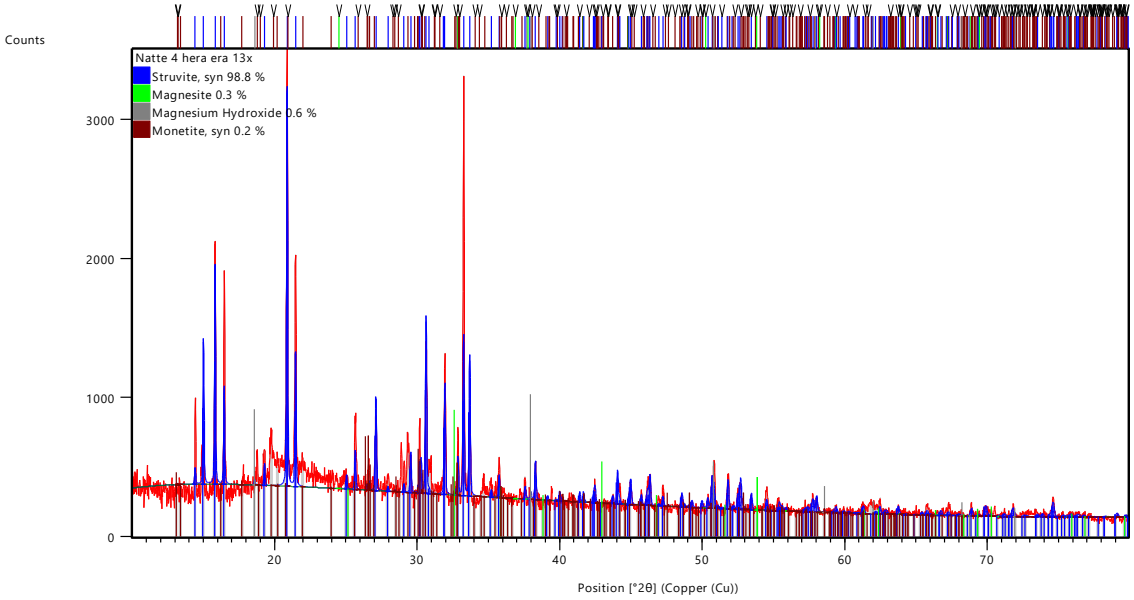
Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor	Chemical Formula
*	04-010-2894	36	Ammonium Magnesium Phosphate Hydrate	0.000	0.190	(N H4) Mg (P O4) (H2 O)6
*	04-009-2317	30	Magnesium Carbonate	0.000	0.255	Mg (C O3)
*	04-015-9383	31	Magnesium Hydroxide	0.000	0.578	Mg (O H)2
*	04-009-6216	28	Hydrogen Calcium Phosphate	0.000	0.080	H Ca (P O4)

Erä 13



Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor	Chemical Formula
*	04-010-2894	57	Ammonium Magnesium Phosphate Hydrate	0.000	0.703	(N H4) Mg (P O4) (H2 O)6
*	04-009-2317	0	Magnesium Carbonate	0.000	0.513	Mg (C O3)
*	04-015-9383	22	Magnesium Hydroxide	0.000	0.062	Mg (O H)2
*	04-009-6216	15	Hydrogen Calcium Phosphate	0.000	0.143	H Ca (P O4)

Erä 13x



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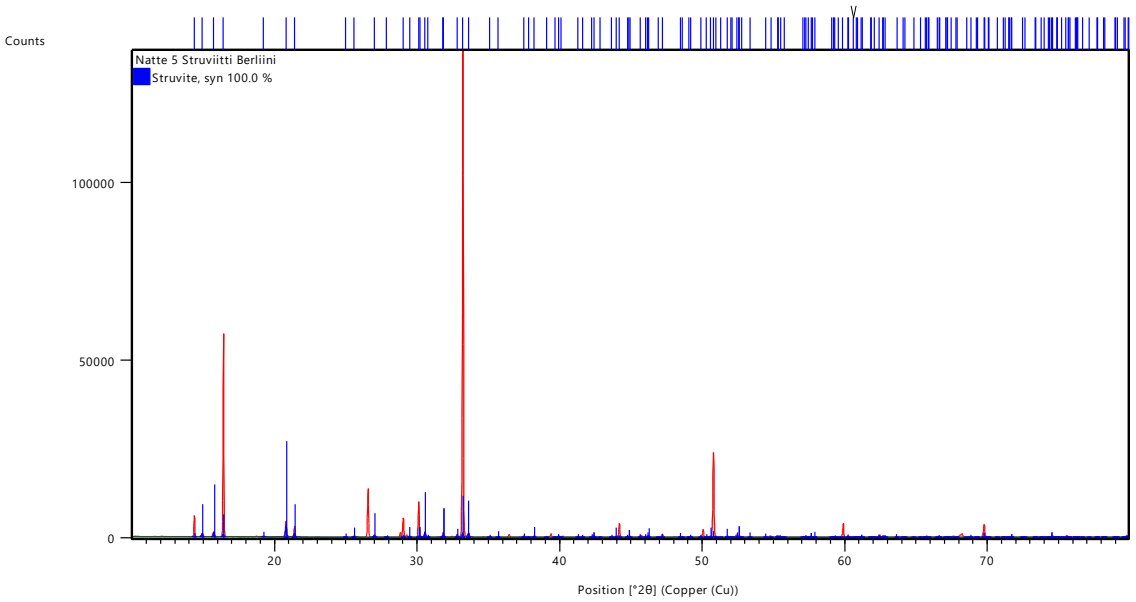
*	04-010-2894	56	Ammonium Magnesium Phosphate Hydrate	0.000	0.453	(N H4) Mg (P O4) (H2 O)6
*	04-009-2317	1	Magnesium Carbonate	0.000	0.175	Mg (C O3)
*	04-015-9383	3	Magnesium Hydroxide	0.000	0.216	Mg (O H)2
*	04-009-6216	12	Hydrogen Calcium Phosphate	0.000	0.112	H Ca (P O4)

Struviitti, Berliini



Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor	Chemical Formula
*	04-010-2894	13	Ammonium Magnesium Phosphate Hydrate	0.000	0.196	(N H4) Mg (P O4) (H2 O)6