AM-85-275

The crystal chemistry of iron-nickel thiospinels

Vaughan and Craig

To be deposited: Table 2

American Mineralogist, 70, 9-10, 7

Table 2. Composition data for natural iron-nickel thiospinels (all data in weight percent)

MINERAL PHASE	Cu	Ni	Co	Fe	S	LOCALITY	REFERENCE
Violarite	0.00	49.48	0.24	9.38	40.74	MARBRIDGE 2, QUE, CANADA	1
"	0.00	37.38	0.43	21.03	41.28	MARBRIDGE No 2 " "	1
"	0.00	46.20	6.70	7.50	39.60	MARBRIDGE No 2 " "	1
"	0.17	28.52	3.85	24.32	41.87	LICK FORK VA, USA	2
"	0.00	28.57	5.34	22.92	41.87	LICK FORK VA, USA	2
"	0.38	30.70	5.82	23.99	41.03	LICK FORK VA, USA	2
"	0.10	24.27	9.69	24.12	42.42	LICK FORK VA, USA	2
"	0.03	29.35	4.33	24.16	43.12	LICK FORK VA, USA	2
"	0.00	13.12	0.19	43.08	40.66	LICK FORK VA, USA	2
"	0.00	12.74	1.35	43.05	41.31	LICK FORK VA, USA	2
"	0.00	33.18	0.67	26.45	39.69	ALEXO, ONT. CANADA	3
"	0.00	19.83	12.49	24.97	42.71	DEVON TWNSHP, ONT, CANADA	3
"	0.00	19.58	11.41	26.18	42.84	PARADEE TWSHP ONT, CANADA	3
"	0.00	22.93	1.64	33.62	41.81	PARADEE TWSHP ONT, CANADA	3
"	0.00	31.47	3.13	24.00	41.41	PARADEE TWSHP ONT, CANADA	3
"	0.00	26.30	4.90	27.72	41.08	WERNER LAKE, ONT, CANADA	3
"	0.00	9.12	1.53	46.27	43.09	WERNER LAKE, ONT, CANADA	3
"	0.00	22.42	3.02	32.38	42.18	WERNER LAKE, ONT, CANADA	3
"	0.00	24.58	2.33	31.04	47.05	WERNER LAKE, ONT, CANADA	3
"	0.00	27.81	2.46	27.75	41.98	WERNER LAKE, ONT, CANADA	3
"	0.00	32.82	0.41	24.61	42.16	WERNER LAKE, ONT, CANADA	3
"	0.00	31.44	0.00	26.80	41.77	WERNER LAKE, ONT, CANADA	3
"	0.00	53.45	0.14	4.62	41.79	MARBRIDGE No 2, QUE,CANADA	3
"	0.00	37.83	1.64	18.25	42.28	MARBRIDGE No 2, QUE,CANADA	3
"	0.00	41.17	6.12	10.69	42.01	MARBRIDGE No 2, QUE,CANADA	3
"	0.00	45.43	0.00	12.51	42.06	EASTRN MTLS, QUE, CANADA	3
"	0.00	50.87	0.00	7.08	42.05	EASTRN MTLS, QUE, CANADA	3
"	0.00	52.94	0.14	4.64	42.29	EASTRN MTLS, QUE, CANADA	3
"	0.00	47.69	0.54	9.67	42.10	DRY NI MN, BINDURA, ZIMBABWE	3
"	0.15	32.48	8.46	16.68	42.23	DRY NI MN, BINDURA, ZIMBABWE	3
"	4.99	31.20	0.95	20.77	42.08	DRY NI MN, BINDURA, ZIMBABWE	3
Polydymite	5.66	45.63	0.93	5.69	42.08	MT. WINDARRA, AUSTRALIA	4
Violarite	2.86	40.33	1.14	13.33	42.34	MT. WINDARRA, AUSTRALIA	4
"	1.26	46.95	0.77	9.01	42.01	MT. WINDARRA, AUSTRALIA	4
"	0.63	49.78	0.19	7.56	41.85	MT. WINDARRA, AUSTRALIA	4
"	0.84	49.07	0.38	7.45	42.27	MT. WINDARRA, AUSTRALIA	4
"	0.21	36.43	0.59	20.20	42.57	MT. WINDARRA, AUSTRALIA	4
"	0.21	35.63	0.19	19.86	44.11	MT. WINDARRA, AUSTRALIA	4
"	0.41	37.02	0.38	19.51	42.68	MT. WINDARRA, AUSTRALIA	4
"	0.21	37.82	0.19	19.24	42.54	MT. WINDARRA, AUSTRALIA	4

Table 2 cont'd.....

Violarite	0.00	34.57	0.21	22.61	42.62	MT WINDARRA, AUSTRALIA	4
"	0.00	34.57	0.21	22.61	42.62	MT WINDARRA, AUSTRALIA	4
"	0.00	32.90	0.40	22.20	42.00	KAMBALDA-DURKIN, AUSTRALIA	5
"	0.00	34.70	0.20	22.70	40.50	KAMBALDA-DURKIN, AUSTRALIA	5
"	0.00	33.60	0.80	21.90	39.40	KAMBALDA-LUNNON, AUSTRALIA	5
"	0.00	30.70	0.04	25.90	40.30	KAMBALDA-DURKIN, AUSTRALIA	5
"	0.00	29.20	0.15	26.10	41.80	KAMBALDA-LUNNON, AUSTRALIA	5
"	0.00	29.50	0.00	27.10	41.20	KAMBALDA-LUNNON, AUSTRALIA	5
"	0.00	29.10	0.08	26.90	40.80	KAMBALDA-LUNNON, AUSTRALIA	5
"	0.00	45.00	0.73	15.10	37.10	MARBRIDGE QUE, CANADA	6
"	0.00	45.50	1.11	12.30	40.30	MARBRIDGE QUE, CANADA	6
"	0.00	46.90	1.22	14.10	40.50	MARBRIDGE QUE, CANADA	6
"	0.00	45.40	0.67	12.30	41.00	MARBRIDGE QUE, CANADA	6
"	0.00	15.00	12.00	33.00	40.00	OAMITES S.W. AFRICA	7
"	0.00	31.78	2.83	19.92	45.17	JULIAN, CALIF. USA	8
"	0.05	36.00	2.66	16.84	42.46	PIPE-INCO, MANI, CANADA	8
"	0.05	36.71	0.86	18.10	42.29	PIPE-INCO, MANI, CANADA	8
Polydymite	0.00	42.64	11.00	4.69	42.30	MUSEN GERMANY	9
Violarite	1.05	33.94	2.50	19.33	42.17	JULIAN, CALIF. USA	10
"	1.12	38.68	1.05	17.01	41.68	SUDBURY, ONT, CANADA	10
"	0.62	41.96	0.00	15.57	40.80	SUDBURY, ONT, CANADA	11
Polydymite	0.00	54.73	0.00	4.94	40.84	GRUNEAU, SIEGEN, WEST GERMANY	12
"	0.00	54.83	0.00	4.21	40.96	GRUNEAU, SIEGEN, WEST GERMANY	12
"	0.00	53.13	0.00	4.12	39.20	GRUNEAU, SIEGEN, WEST GERMANY	12
"	0.00	53.51	0.61	3.84	40.27	GRUNEAU, SIEGEN, WEST GERMANY	12
"	0.00	54.30	0.63	3.98	41.09	GRUNEAU, SIEGEN, WEST GERMANY	12
Violarite	0.00	35.31	2.56	19.35	41.84	GAP MINE, PA, USA	13
"	0.00	40.38	0.60	17.94	41.02	VERMILLION MN., SUDBURY, ONT.	8
"	0.00	30.00	0.00	29.20	39.10	ROBERTS VICTOR MINES, S. AFRICA	14
"	0.00	21.50	0.00	40.50	41.60	ROBERTS VICTOR MINES, S. AFRICA	14
"	0.37	30.12	5.71	23.54	40.26	LICK FORK, VA. USA	8
"	0.32	32.64	4.45	22.24	40.34	LICK FORK, VA. USA	8
"	0.00	34.57	1.79	21.49	42.15	WHISTLE PROP,SUDBURY,ONT.CANADA	15
"	0.00	30.39	1.79	25.68	42.14	WHISTLE PROP,SUDBURY,ONT.CANADA	15
"	0.00	37.63	2.18	17.51	42.67	DISCOVERY SITE	15
"	0.00	23.62	2.05	32.45	41.89	DISCOVERY SITE	15
Polydymite	0.00	53.62	2.16	0.76	41.79	VIBURNAM, MO. USA	8
"	0.00	54.19	1.36	2.78	41.67	HANCOCK CO. ILL, USA	8
"	0.91	52.17	2.14	3.18	41.60	TRANSVAAL S. AFRICA	8
"	0.00	53.39	2.49	3.10	41.02	TRANSVAAL S. AFRICA	8
"	0.95	48.33	0.68	9.21	40.83	LINDON WISC, USA	8
Violarite	1.71	37.05	0.31	19.97	40.96	KAMBALDA AUSTRALIA	8

Table 2 cont'd....

Polydymite	0.91	52.17	2.14	3.18	41.60	KAMBALDA AUSTRALIA	8
Violarite	1.73	33.84	4.17	18.97	41.29	DRY NI MN BINDURA , ZIMBABWE	8
"	0.84	38.49	1.05	18.33	41.29	SUDBURY ONT, CANADA	8
"	7.44	36.74	0.73	16.39	37.54	SUDBURY ONT, CANADA	8
"	7.24	36.98	0.71	16.23	39.21	SUDBURY ONT, CANADA	8
"	8.88	35.77	0.72	16.29	38.75	SUDBURY ONT, CANADA	8
"	0.00	40.07	1.82	16.68	42.42	SUDBURY ONT, CANADA	15
"		36.53	1.34	19.44	42.49	COOLAC, N.S.W. AUSTRALIA	16
"	0.04	34.91	0.03	17.65	37.02	TAOKOU, SHANTUNG, CHINA	17
"	1.40	18.20	1.30	34.70	34.40	PIERREFITTE, FRANCE	34
Greigite				36.86	28.10	KERCH PENINSULA, USSR	17
"				57.62	42.38	SAMARA, USSR	18
"				55.88	44.12	SAMARA, USSR	18
"				55.38	44.62	SAMARA, USSR	18
	0.03			56.88	43.22	YAKUTIA	19
							20
Violarite	5.70	36.20	1.20	6.00	42.20	GEISSPEAD, SWITZ	21
Greigite				33.71	25.92	MONTEMESOLA, ITALY	22
Violarite		31.18	1.15	24.99	41.22	CARR BOYD COMPLE	23
Polydymite	1.26	14.97	0.42	25.58	30.23	KUNRATICE, CZECH	24
"	1.99	15.62	0.44	27.59	20.82	ROZANY, CZECH	24
"	0	52.65	0.38	3.79	42.03	BLACK SWAN, AUSTRALIA	25
"	0	37.48	8.71	10.27	42.59	BLACK SWAN, AUSTRALIA	25
"	0	46.53	0.14	12.31	41.02	BLACK SWAN, AUSTRALIA	25
"	0	53.65	0.41	3.48	42.46	BLACK SWAN, AUSTRALIA	25
"	0	53.25	0.41	3.87	42.48	BLACK SWAN, AUSTRALIA	25
"	0	48.01	2.59	6.47	42.93	BLACK SWAN, AUSTRALIA	25
"	0	42.91	4.80	8.71	43.58	BLACK SWAN, AUSTRALIA	25
"	0	37.87	8.75	10.37	43.01	BLACK SWAN, AUSTRALIA	25
"	0	57.15	0.14	0.51	42.20	BLACK SWAN, AUSTRALIA	25
"	0	48.79	4.09	4.14	42.98	BLACK SWAN, AUSTRALIA	25
"	0	47.77	6.27	2.97	42.99	BLACK SWAN, AUSTRALIA	25
"	0	55.12	0.27	1.68	42.93	BLACK SWAN, AUSTRALIA	25
Violarite	0	35.70	0.04	21.60	40.80	MIRIAM, AUSTRALIA	26
"	0	37.10	0.60	20.20	39.20	MIRIAM, AUSTRALIA	26
Polydymite	0	58.50	0.00	0.00	41.40	PRIBAUM, GERMANY	27
Violarite						NEPEAN, AUSTRALIA	8
"	0	5.37	1.93	53.72	39.03	SUDBURY, ONT, CANADA	28
"	0	9.75	3.15	47.65	40.27	SUDBURY, ONT, CANADA	28
"	0	18.85	6.07	33.96	40.38	SUDBURY, ONT, CANADA	28
"	0	24.30	5.37	24.68	40.67	SUDBURY, ONT, CANADA	28
	0	7.31	1.22	52.87	38.10	SUDBURY, ONT, CANADA	28

Table 2 cont'd.....

Violarite	0	5.87	3.56	51.85	39.28	SUDBURY , ONT, CANADA	28
"	0	8.75	2.45	49.62	38.89	SUDBURY , ONT, CANADA	28
"	0	38.13	0.74	17.74	39.74	PIPE , MAN, CANADA	28
"	0	37.52	0.70	18.44	39.52	PIPE , MAN, CANADA	28
"	0	39.47	0.69	17.39	40.46	PIPE , MAN, CANADA	28
"	0	40.55	0.65	17.46	40.50	PIPE , MAN, CANADA	28
"	0	38.57	1.36	16.59	38.82	PIPE , MAN, CANADA	28
"	0	39.17	2.72	15.51	41.40	PIPE , MAN, CANADA	28
"	0	15.17	1.07	41.74	40.36	SUDBURY , ONT, CANADA	28
"	0	17.61	3.09	37.21	41.78	SUDBURY , ONT, CANADA	28
"	0	11.23	0.95	45.22	39.79	SUDBURY , ONT, CANADA	28
"	0	8.37	1.79	49.99	39.70	SUDBURY , ONT, CANADA	28
"	0	20.46	9.16	29.61	42.34	SUDBURY , ONT, CANADA	28
"	0	13.10	3.27	41.66	40.65	SUDBURY , ONT, CANADA	28
"	0	20.29	7.30	30.26	41.75	SUDBURY , ONT, CANADA	28
"	0	14.57	4.32	39.46	40.21	SUDBURY , ONT, CANADA	28
"	0	34.42	0.90	23.56	41.51	MASKWA , MAN, CANADA	8
"	0	31.56	0.86	25.60	38.10	MASKWA , MAN, CANADA	8
"	0	33.11	0.65	25.27	41.13	MASKWA , MAN, CANADA	8
"	0	35.03	0.82	27.76	40.68	MASKWA , MAN, CANADA	8
"	0	35.51	0.90	21.29	40.01	MASKWA	8
"	0	41.81	0.20	15.99	41.99	KAMBALDA AUSTRALIA	29
"	0	40.40	0.31	18.31	40.98	KAMBALDA AUSTRALIA	29
"	0	42.60	0.54	17.06	39.80	KAMBALDA AUSTRALIA	29
"	0	39.19	0.34	19.45	41.02	KAMBALDA AUSTRALIA	29
"	0	40.59	0.33	16.46	42.62	KAMBALDA AUSTRALIA	29
"	0	43.01	0.39	15.12	41.48	KAMBALDA AUSTRALIA	29
"	0	40.59	0.22	19.47	39.72	KAMBALDA AUSTRALIA	29
"	0	35.27	0.29	23.08	41.36	KAMBALDA AUSTRALIA	29
"	0	35.71	0.26	23.15	40.88	KAMBALDA AUSTRALIA	29
"	0	40.29	0.03	18.91	40.77	KAMBALDA AUSTRALIA	29
"	0	36.47	0.09	22.73	40.70	KAMBALDA AUSTRALIA	29
"	0	38.69	0.14	20.00	41.17	KAMBALDA AUSTRALIA	29
"	0	34.21	0.14	22.30	43.35	KAMBALDA AUSTRALIA	29
"	0.00	36.62	0.14	21.37	41.87	KAMBALDA AUSTRALIA	29
"	0.00	35.70	0.11	23.22	40.97	KAMBALDA AUSTRALIA	29
"	0.00	36.23	0.11	22.55	41.11	KAMBALDA AUSTRALIA	29
"	0.00	33.58	0.01	25.80	40.60	KAMBALDA AUSTRALIA	29
"	0.00	33.80	0.14	25.30	40.76	KAMBALDA AUSTRALIA	29
"	0.00	43.93	0.05	15.06	40.96	KAMBALDA AUSTRALIA	29
"	0.00	45.71	0.04	12.75	41.48	KAMBALDA AUSTRALIA	29
Polydymite	0.00	55.57	0.17	42.5	40.00	KAMBALDA AUSTRALIA	29

Polydymite	0.00	55.67	0.32	3.86	40.15	KAMBALDA AUSTRALIA	29
"	0.00	51.76	0.23	5.28	42.72	KAMBALDA AUSTRALIA	29
"	0.00	50.02	0.04	8.79	41.15	KAMBALDA AUSTRALIA	29
Violarite	0.00	46.77	0.14	10.58	42.51	KAMBALDA AUSTRALIA	29
"	0.00	45.59	0.15	11.22	43.04	KAMBALDA AUSTRALIA	29
Polydymite	0.00	50.35	0.23	9.38	40.05	KAMBALDA AUSTRALIA	29
"	0.00	51.22	0.19	5.88	42.71	KAMBALDA AUSTRALIA	29
"	0.00	52.61	0.36	7.62	39.40	KAMBALDA AUSTRALIA	29
"	0.00	49.22	0.19	9.22	41.04	KAMBALDA AUSTRALIA	29
"	0.00	52.61	0.36	7.62	39.40	KAMBALDA AUSTRALIA	29
"	0.00	51.91	0.11	6.46	41.52	KAMBALDA AUSTRALIA	29
"	0.00	52.04	0.25	5.75	41.95	KAMBALDA AUSTRALIA	29
"	0.00	58.74	0.07	1.23	39.97	KAMBALDA AUSTRALIA	29
"	0.00	57.26	0.19	1.48	41.07	KAMBALDA AUSTRALIA	29
"	0.00	58.10	0.25	1.43	40.21	KAMBALDA AUSTRALIA	29
"	0.00	55.74	0.16	1.24	42.86	KAMBALDA AUSTRALIA	29
"	0.00	54.02	0.13	5.75	40.10	KAMBALDA AUSTRALIA	29
"	0.00	53.18	0.17	7.34	39.31	KAMBALDA AUSTRALIA	29
"	0.00	48.41	0.14	8.47	42.98	KAMBALDA AUSTRALIA	29
"	0.00	51.33	0.39	6.69	41.59	KAMBALDA AUSTRALIA	29
"	0.00	41.60	0.22	6.29	41.90	KAMBALDA AUSTRALIA	29
"	0.00	50.77	0.18	7.37	41.68	KAMBALDA AUSTRALIA	29
"	0.00	50.87	0.12	8.00	41.02	KAMBALDA AUSTRALIA	29
"	0.00	50.61	0.07	7.45	41.88	KAMBALDA AUSTRALIA	29
"	0.00	56.93	0.38	1.22	41.47	KAMBALDA AUSTRALIA	29
"	0.00	58.04	0.13	1.11	40.72	KAMBALDA AUSTRALIA	29
"	0.00	57.31	0.18	1.20	41.32	KAMBALDA AUSTRALIA	29
"	0.00	50.72	0.25	6.11	42.93	KAMBALDA AUSTRALIA	29
Violarite	0.00	42.81	0.23	13.88	43.08	KAMBALDA AUSTRALIA	29
Polydymite	0.00	48.67	1.19	7.48	42.66	KAMBALDA AUSTRALIA	29
"	0.00	45.01	6.36	7.27	41.37	KAMBALDA AUSTRALIA	29
Violarite	0.00	37.02	10.26	13.26	39.37	KAMBALDA AUSTRALIA	29
Polydymite	0.00	43.11	6.25	7.80	42.84	KAMBALDA AUSTRALIA	29
Violarite	0.73	34.27	3.13	19.85	38.40	BUSHVELD S. AFRICA	8
"	0.32	33.23	3.22	19.47	38.45	BUSHVELD S. AFRICA	8
"	0.49	30.59	3.09	21.23	37.94	BUSHVELD S. AFRICA	8
"	0.41	36.91	3.99	17.40	38.42	BUSHVELD S. AFRICA	8
"	0.47	33.71	3.82	18.55	39.84	BUSHVELD S. AFRICA	8
"	0.40	33.31	3.86	18.96	39.99	BUSHVELD S. AFRICA	8
"	0.50	33.25	3.33	17.45	39.71	BUSHVELD S. AFRICA	8
"	0.65	38.41	3.65	18.16	39.92	BUSHVELD S. AFRICAN	8

ble 2 cont'd.....

olarite	0.62	35.65	3.80	18.33	39.70	BUSHVELD S. AFRICA	8
"	0.59	34.39	3.92	18.50	39.41	BUSHVELD S. AFRICA	8
eigite	0.00	0.00	0.00	40.30	30.90	SAN BERN. CAL. USA	30
"	0.00	0.22	0.00	49.50	37.53	MACEDONIA, GREECE	31
	0.08	0.10	0.00	56.50	42.20	ZACATECAS, MEXICO	32
olarite	3.20	24.20	3.80	27.80	41.60	KALGOORLIE, AUSTRALIA	33
"	3.20	24.50	4.00	28.50	40.80	KALGOORLIE, AUSTRALIA	33
"	2.90	29.90	3.20	19.90	42.80	KALGOORLIE, AUSTRALIA	33
"	3.00	29.20	2.30	22.10	43.50	KALGOORLIE, AUSTRALIA	33
"	3.30	31.20	1.70	22.70	41.60	KALGOORLIE, AUSTRALIA	33
"	1.90	30.20	2.90	22.20	39.80	KALGOORLIE, AUSTRALIA	33
"	0.10	45.50	8.60	4.50	41.40	KALGOORLIE, AUSTRALIA	33
"	0.10	44.00	10.50	3.20	42.20	KALGOORLIE, AUSTRALIA	33
	0.10	43.20	10.90	3.00	42.40	KALGOORLIE, AUSTRALIA	33

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