TABLE S1. Major oxide compositions of magnetite and ilmenite exsolution in titanomagnetite (in wt.%)

Major oxides	Magnetite							Ilmenite exsolution					Bulk composition*
	1	2	3	4	5	6	**Average**	1	2	3	4	**Average**	
MgO	0.02	0.00	0.01	0.06	0.04	0.04	**0.03**	0.20	0.23	0.27	0.22	**0.23**	**0.09**
Al_2O_3	0.06	0.04	0.01	0.26	0.09	0.13	**0.10**	0.00	0.03	0.02	0.03	**0.02**	**0.08**
FeO*	31.19	30.96	32.22	32.04	32.13	32.24	**31.80**	42.02	42.22	43.61	45.22	**43.27**	**78.76 (ΣFeO)**
Fe_2O_3*	66.02	65.62	67.70	68.03	68.79	68.25	**67.40**	9.47	8.66	4.12	3.70	**6.49**	
MnO	0.00	0.00	0.01	0.00	0.05	0.00	**0.01**	0.77	0.82	0.72	0.18	**0.62**	**0.21**
Cr_2O_3	0.01	0.04	0.00	0.05	0.07	0.04	**0.03**	0.00	0.02	0.02	0.00	**0.01**	**0.03**
V_2O_3	0.88	0.87	0.98	0.41	0.43	0.47	**0.67**	0.47	0.45	0.52	0.18	**0.41**	**0.57**
TiO_2	0.54	0.51	0.71	0.49	0.48	0.63	**0.56**	47.93	48.32	49.78	50.26	**49.07**	**15.75**
Total	98.71	98.03	101.64	101.33	102.06	101.80	**100.59**	100.86	100.76	99.05	99.80	**100.12**	**95.49**
													X_{Usp} = 0.45
													X_{Mag} = 0.55

*Notes: Redistribution of the measured ΣFeO between Fe_2O_3 and FeO is on the basis of charge balance and stoichiometry of ilmenite; the bulk composition including the host magnetite and the ilmenite exsolution is based on modal proportion analysis of the sample in **Fig.2**, the ilmenite exsolution takes up ~34 vol.% of the titanomagnetite grain; X_{Usp} and X_{Mag} refer to mole fractions of ulvöspinel and magnetite, respectively.

TABLE S2. Oxygen fugacity and temperature of Fe_3O_4-Fe_2TiO_4 and Fe_2O_3-$FeTiO_3$ solid solution pair determined by QUILF-95 at P = 5 kbar*

	fO_2 (ΔFMQ)	T (℃)		fO_2 (ΔFMQ)	T (℃)		fO_2 (ΔFMQ)	T (℃)		fO_2 (ΔFMQ)	T (℃)
NTi0.1, XIlm0.70	2.88	749	NTi0.3, XIL0.85	0.99	851	NTi0.45, XIL0.94	-0.71	776	NTi0.65, XIL0.85	0.05	1179
NTi0.1, XIlm0.75	2.79	740	NTi0.3, XIlm0.90	0.49	796	NTi0.45, XIlm0.96	-1.48	697	NTi0.65, XIlm0.90	-0.37	1061
NTi0.1, XIlm0.80	2.62	727	NTi0.3, XIlm0.92	0.14	763	NTi0.50, XIlm0.70	0.86	1148	NTi0.65, XIlm0.92	-0.65	995
NTi0.1, XIlm0.85	2.32	706	NTi0.3, XIlm0.94	-0.38	719	NTi0.50, XIlm0.75	0.74	1098	NTi0.65, XIlm0.94	-1.08	911
NTi0.1, XIlm0.90	1.71	672	NTi0.3, XIlm0.96	-1.24	658	NTi0.50, XIlm0.80	0.60	1051	NTi0.65, XIlm0.96	-1.79	799
NTi0.1, XIlm0.92	1.28	651	NTi0.4, XIlm0.70	1.14	1029	NTi0.50, XIlm0.85	0.37	994	NTi0.70, XIlm0.90	-0.44	1140
NTi0.1, XIlm0.94	0.64	622	NTi0.4, XIlm0.75	1.03	995	NTi0.50, XIlm0.90	-0.06	911	NTi0.70, XIlm0.92	-0.73	1065
NTi0.1, XIlm0.96	-0.38	582	NTi0.4, XIlm0.80	0.89	960	NTi0.50, XIlm0.92	-0.36	862	NTi0.70, XIlm0.94	-1.15	971
NTi0.2, XIlm0.70	1.99	851	NTi0.4, XIlm0.85	0.65	915	NTi0.50, XIlm0.94	-0.81	800	NTi0.70, XIlm0.96	-1.85	845
NTi0.2, XIlm0.75	1.89	835	NTi0.4, XIlm0.90	0.19	847	NTi0.50, XIlm0.96	-1.56	715	NTi0.80, XIlm0.90	-0.50	1398
NTi0.2, XIlm0.80	1.73	816	NTi0.4, XIlm0.92	-0.13	807	NTi0.60, XIlm0.96	-1.71	763	NTi0.80, XIlm0.92	-0.79	1295
NTi0.2, XIlm0.85	1.45	789	NTi0.4, XIlm0.94	-0.61	755	NTi0.60, XIlm0.94	-1.00	865	NTi0.80, XIlm0.94	-1.22	1167
NTi0.2, XIlm0.90	0.90	744	NTi0.4, XIlm0.96	-1.41	683	NTi0.60, XIlm0.92	-0.56	941	NTi0.80, XIlm0.96	-1.92	1001
NTi0.2, XIlm0.92	0.52	717	NTi0.45, XIlm0.70	0.99	1083	NTi0.60, XIlm0.90	-0.27	1000	NTi0.85, XIlm0.94	-1.18	1349
NTi0.2, XIlm0.94	-0.05	681	NTi0.45, XIlm0.75	0.88	1043	NTi0.60, XIlm0.85	0.14	1104	NTi0.85, XIlm0.96	-1.89	1143
NTi0.2, XIlm0.96	-0.98	630	NTi0.45, XIlm0.80	0.74	1002	NTi0.60, XIlm0.80	0.36	1178			
NTi0.3, XIlm0.70	1.50	936	**NTi0.45, XIlm0.85**	**0.51**	**952**	NTi0.60, XIlm0.75	0.51	1244			
NTi0.3, XIlm0.75	1.39	913	NTi0.45, XIlm0.90	0.06	877	NTi0.60, XIlm0.70	0.64	1319			
NTi0.3, XIlm0.80	1.24	886	NTi0.45, XIlm0.92	-0.25	833	NTi0.65, XIlm0.80	0.27	1265			

*Notes: The pressure is set to be 5 kbar, which is based on the emplacement depth of mafic-ultramafic intrusions in the Panxi region that was estimated in an earlier study by Pang et al. (2008); NTi, number of Ti in spinel (3 cations/ 4 oxygens); XIlm, $FeTiO_3$/(Fe_2O_3 + $FeTiO_3$ + $MgTiO_3$ + $MnTiO_3$) in ilmenite.