

Supplementary Table S4. Sr–Nd data of Early Permian intrusions from northern NCC and Paleoproterozoic mafic dykes from Western Shandong peninsula

Sample	No.	$^{87}\text{Sr}/^{86}\text{Sr}$	2 $\sigma$	$^{143}\text{Nd}/^{144}\text{Nd}$	2 $\sigma$	$\epsilon_{\text{Nd}}(0)$	$\epsilon_{\text{Nd}}(t)$	Reference
Boluonuo complexes (T = 300 Ma)	1	0.705483	0.000013	0.51195	0.000013	-13.4	-10.9	Zhang et al., 2009a
	2	0.706271	0.000015	0.512014	0.000013	-12.2	-13.4	
Liuying complexes (T = 300 Ma)	1	0.705716	0.000012	0.511862	0.000013	-15.1	-14.1	
Xianghuangqi–Wudaoyingzi pluton (T = 280 Ma)	1	0.705997	0.00001	0.512016	0.000011	-12.1	-9.3	
	2	0.7062	0.000011	0.511936	0.000012	-13.7	-11.1	Zhang et al., 2012
	1	0.707986	0.000012	0.511979	0.000014	-12.9	-8.9	
	2	0.707761	0.000013	0.511746	0.000013	-17.4	-13.68	
	3	0.708272	0.000012	0.511954	0.000021	-13.3	-9.95	
	4	0.708178	0.000012	0.511844	0.000012	-15.5	-12.26	
	5	0.70965	0.000013	0.511834	0.000011	-15.7	-13.13	
	6	0.706283	0.000011	0.511936	0.000015	-13.7	-10.84	
	7	0.709802	0.000016	0.511815	0.000014	-16.1	-13.4	
	8	0.708317	0.000012	0.511932	0.000014	-13.8	-10.58	
	9	0.708478	0.00001	0.511961	0.000013	-13.2	-10.45	
	10	0.708552	0.00001	0.511932	0.000012	-13.8	-10.99	
Appinitic intrusions from south Inner Mongolia	11	0.705941	0.000011	0.512069	0.000013	-11.1	-8.27	Zhang et al., 2011
	12	0.705657	0.000011	0.512054	0.000014	-11.4	-8.79	
	1	0.70589	0.00001	0.512078	0.000017	-10.9	-8.08	
	2	0.705821	0.000011	0.512043	0.000012	-11.6	-8.71	
	3	0.704658	0.000011	0.512097	0.000012	-10.6	-7.74	
	4	0.704783	0.000013	0.512094	0.000016	-10.6	-7.82	
	5	0.704735	0.00001	0.512096	0.000016	-10.6	-7.73	
	6	0.705917	0.00001	0.511985	0.000013	-12.7	-9.75	
	7	0.705795	0.000011	0.511981	0.000012	-12.8	-9.9	
	8	0.705468	0.000012	0.511961	0.000015	-13.2	-10.2	
	9	0.706743	0.000011	0.51208	0.000018	-10.9	-7.73	
Guyang batholith								

	10	0.706016	0.00001	0.512024	0.000015	-12.0	-9.2	
	11	0.705977	0.000011	0.512019	0.000013	-12.1	-9.36	
	12	0.70691	0.000011	0.511798	0.00001	-16.4	-13.81	
	13	0.706568	0.000011	0.511787	0.000015	-16.6	-13.77	
	14	0.70729	0.000012	0.511802	0.000014	-16.3	-13.86	
	15	0.708886	0.000009	0.511758	0.000014	-17.2	-13.51	
	16	0.70627	0.00001	0.512258	0.000015	-7.4	-4.67	
	17	0.706258	0.000011	0.511773	0.000012	-16.9	-13.88	
	18	0.706158	0.000011	0.511913	0.000011	-14.1	-11.44	
	19	0.706391	0.00001	0.511996	0.000014	-12.5	-9.85	
	20	0.707028	0.000012	0.511958	0.000012	-13.3	-10.12	
	21	0.706751	0.000012	0.511963	0.000013	-13.2	-10.36	
	22	0.706907	0.000011	0.511981	0.000013	-12.8	-10.1	
	23	0.707625	0.000015	0.511822	0.000011	-15.9	-12.34	
	24	0.707188	0.000012	0.511893	0.000012	-14.5	-10.52	
	25	0.705331	0.00001	0.512054	0.000011	-11.4	-8.48	
	26	0.707449	0.000012	0.511886	0.00001	-14.7	-10.88	
	27	0.706611	0.000012	0.511944	0.000011	-13.5	-10.1	
	28	0.710298	0.000013	0.511888	0.000009	-14.6	-11.31	
	29	0.706795	0.000013	0.512047	0.000012	-11.5	-8.36	
Xianghuangqi–Wudaoyingzi pluton (T = 280 Ma)	1	0.705997	0.00001	0.512016	0.000012	-12.1	-9.3	
	2	0.706256	0.000013	0.511794	0.000012	-16.5	-13.2	
	3	0.705985	0.000013	0.511817	0.000013	-16.0	-13.1	
	4	0.7062	0.000011	0.511936	0.000012	-13.7	-11.1	
Tianqiao pluton (T = 285 Ma)	1	0.706332	0.000013	0.511903	0.000013	-14.3	-11.2	Zhang et al., 2009b
	2	0.706529	0.000008	0.511781	0.000013	-16.7	-14.2	
Lingying pluton (T = 288 Ma)	1	0.706051	0.000013	0.511526	1.000013	-21.7	-17.4	
Zhoutaizi pluton (T = 291 Ma)	1	0.705524	0.000011	0.511889	0.000011	-14.6	-11	
Longhua pluton 311 Ma	1	0.708518	0.000014	0.51179	0.000009	-16.5	-12.6	Zhang et al., 2009c

	2	0.709116	0.000012	0.511788	0.000011	-16.6	-12.9	
	1	0.70494	0.000011	0.511888	0.00001	-14.6	-11	
Daguangding pluton 318 Ma	2	0.704814	0.000011	0.511934	0.000009	-13.7	-9.9	
	3	0.704991	0.000009	0.511836	0.000011	-15.6	-11.5	
Boluonuo PLUTON (T = 302 Ma)	1	0.705084	1.00001	0.511632	0.000012	-19.6	-15.9	
	2	0.705238	0.000011	0.511656	0.000012	-19.2	-15.6	
Hushiha pluton 310 Ma	1	0.705147	0.000011	0.511829	0.000012	-15.8	-11.5	
	2	0.705033	0.000011	0.511545	0.000011	-21.3	-17.1	
Jianping diorite pluton 304 Ma	1	0.708109	1.00001	0.511831	0.000012	-15.7	-12.1	
	2	0.711185	1.00001	0.511692	0.000012	-18.5	-15.3	
	1	0.706103	0.000018	0.512094	0.000006	-10.6	-8.2	
	2	0.705864	0.00002	0.512074	0.000007	-11.0	-8.2	
	3	0.705365	0.000016	0.512024	0.000011	-12.0	-9.6	
Boluonuo PLUTON (T = 296 Ma)	4	0.705409	0.000018	0.512026	0.000006	-11.9	-9.8	
	5	0.704931	0.000016	0.511781	0.000005	-16.7	-13.1	
	6	0.70473	0.000014	0.511697	0.00001	-18.4	-14.6	Ma et al., 2013
	7	0.70482	0.00002	0.511613	0.000007	-20.0	-16.5	
	1	0.705491	0.000013	0.51177	0.000006	-16.9	-11.8	
Daguangding pluton 314 Ma	2	0.705734	0.000017	0.511757	0.000007	-17.2	-12.2	
	3	0.706275	0.000017	0.511686	0.000007	-18.6	-15.2	

Zhang, S.H., Zhao, Y., Liu, X.C., Liu, D.Y., Chen, F., Xie, L.W. and Chen, H.H., 2009a. Late Paleozoic to Early Mesozoic mafic–ultramafic complexes from the northern North China Block: constraints on the composition and evolution of the lithospheric mantle. *Lithos*, 110(1-4), pp.229-246.

Zhang, X., Gao, Y., Wang, Z., Liu, H. and Ma, Y., 2012. Carboniferous appinitic intrusions from the northern North China craton: geochemistry, petrogenesis and tectonic implications. *Journal of the Geological Society*, 169(3), pp.337-351.

Zhang, X., Mao, Q., Zhang, H., Zhai, M., Yang, Y. and Hu, Z., 2011. Mafic and felsic magma interaction during the construction of high-K calc-alkaline plutons within a metacratonic passive margin: the Early Permian Guyang batholith from the northern North China Craton. *Lithos*, 125(1-2), pp.569-591.

Zhang, S.H., Zhao, Y., Kröner, A., Liu, X.M., Xie, L.W. and Chen, F.K., 2009b. Early Permian plutons from the northern North China Block: constraints on continental arc evolution and convergent margin magmatism related to the Central Asian Orogenic Belt. *International Journal of Earth Sciences*, 98(6), pp.1441-1467.

Zhang, S.H., Zhao, Y., Song, B., Hu, J.M., Liu, S.W., Yang, Y.H., Chen, F.K., Liu, X.M. and Liu, J., 2009c. Contrasting Late Carboniferous and Late Permian–Middle Triassic intrusive suites from the northern margin of the North China craton: Geochronology, petrogenesis, and tectonic implications. *Geological Society of America Bulletin*, 121(1-2), pp.181-200.

Ma, X., Chen, B., Chen, J. and Niu, X., 2013. Zircon SHRIMP U-Pb age, geochemical, Sr-Nd isotopic, and in-situ Hf isotopic data of the Late Carboniferous-Early Permian plutons in the northern margin of the North China Craton. *Science China Earth Sciences*, 56(1), pp.126-144.