Datashare 175

Hypogenic karstic cavities formed by tectonic-driven fluid mixing in the Ordovician carbonates from the Tarim Basin, northwestern China

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Table S1. The $\delta^{13}C$, $\delta^{18}O$ Isotopic Values and $^{87}Sr/^{86}Sr$ Ratios of Carbonates from the Ordovician of the Tarim Basin, Northwestern China

Area	Sample Number	$\delta^{13}C$‰	$\delta^{18}O$‰	$^{87}Sr/^{86}Sr$
Outcrop	Outcrop-1	−0.84	−14.86	0.709286
	Outcrop-2	−1.61	−7.49	0.7088
	Outcrop-3	−1.49	−7.65	0.7089
	Outcrop-4	2.49	−16.57	0.709249
	Outcrop-5	0.82	−13.79	0.709462
	Outcrop-6	−1.86	−10.5	0.708985
	Outcrop-7	−7.11	−14.14	0.7092
	Outcrop-8	−1.75	−10.32	0.70926
	Outcrop-9	−0.8	−8.28	0.709171
	Outcrop-10	−2.29	−11.37	0.709083
	Outcrop-11	−1.66	−16.13	0.7103
	Outcrop-12	−2.32	−17.39	0.7104
	Outcrop-13	−2.72	−14.99	0.7095
	Outcrop-14	−2.66	−15.5	0.7096
	Outcrop-15	−4.98	−13.3	0.7099
	Outcrop-16	0.63	−5.41	–
	Outcrop-17	0.66	−7.65	–
	Outcrop-18	−0.76	−7.98	0.708824
	Outcrop-19	−1.37	−8.33	0.709231
	Outcrop-20	−0.88	−8.3	0.70984
Tazhong	Tazhong-21	−7	−10.28	–
	Tazhong-22	−6.65	−8.95	0.70932
	Tazhong-23	−5.93	−6.17	–
	Tazhong-24	−4.81	−5.29	0.7092
	Tazhong-25	−9.21	−6.995	–
	Tazhong-26	−8.12	−8.64	0.70945
	Tazhong-27	−3.88	−11.07	0.70975
	Tazhong-28	−2.53	−14.84	–
	Tazhong-29	−1.02	−8.02	0.70901
	Tazhong-30	−2.66	−6.99	0.70991
	Tazhong-31	1.49	−7.59	0.70805
	Tazhong-32	1.23	−6.91	0.70805
	Tazhong-33	−0.79	−7.56	–
	Tazhong-34	−0.66	−7.33	0.70832

(*continued*)

Table S1. Continued

Area	Sample Number	$\delta^{13}C$‰	$\delta^{18}O$‰	$^{87}Sr/^{86}Sr$
	Tazhong-35	1.29	−6.83	0.70809
	Tazhong-36	2.5	−7.09	0.70818
	Tazhong-37	0.44	−6.72	0.70883
	Tazhong-38	−1.41	−6.39	0.70878
	Tazhong-39	1.64	−7.48	0.70815
	Tazhong-40	−0.82	−8.93	0.70823
	Tazhong-41	−0.56	−8.67	–
	Tazhong-42	0.97	−7.04	0.70922
	Tazhong-43	−1.49	−7.22	0.70897
	Tazhong-44	−2.67	−7.45	–
	Tazhong-45	0.29	−7.02	0.70877
	Tazhong-46	−0.03	−8.43	0.70879
	Tazhong-47	−1.09	−10.48	0.70904
	Tazhong-48	0.72	−8.83	–
	Tazhong-49	−1.05	−10.54	0.7091
	Tazhong-50	1.23	−8.03	0.70839
	Tazhong-51	0.56	−8.03	–
	Tazhong-52	0.1	−8.16	0.70921
	Tazhong-53	0.5	−10.29	0.70877
	Tazhong-54	0.54	−9.65	–
	Tazhong-55	−1	−8.92	0.70917
	Tazhong-56	−1.4	−8.72	0.70901
	Tazhong-57	0.21	−8.97	0.70897
	Tazhong-58	−2.42	−10.87	–
	Tazhong-59	−2.79	−8.94	–
	Tazhong-60	−2.66	−13.17	0.70963
	Tazhong-61	−5.87	−7.66	–
	Tazhong-62	−5.69	−9.42	–
	Tazhong-63	−3	−10.91	0.70992
	Tazhong-64	−2.74	−7.93	0.70944
	Tazhong-65	−2.48	−12.37	0.70957
	Tazhong-66	−6.86	−10.32	–
	Tazhong-67	−7.23	−9.11	–
	Tazhong-68	−0.872	−8.562	–
	Tazhong-69	0.571	−8.642	–
	Tazhong-70	−1.375	−8.083	–

(*continued*)

Table S1. Continued

Area	Sample Number	$\delta^{13}C$‰	$\delta^{18}O$‰	$^{87}Sr/^{86}Sr$
	Tazhong-71	−1.358	−8.046	–
	Tazhong-72	1.129	−5.777	–
	Tazhong-73	1.075	−8.436	–
	Tazhong-74	−0.025	−13.725	–
	Tazhong-75	3.945	−5.243	–
	Tazhong-76	0.294	−9.016	–
	Tazhong-77	0.868	−8.827	–
	Tazhong-78	0.207	−9.679	–
	Tazhong-79	1.269	−5.452	–
	Tazhong-80	−2.713	−9.383	–
	Tazhong-81	−2.494	−8.299	–
	Tazhong-82	2.382	−7.759	–
	Tazhong-83	−3.146	−6.903	–
	Tazhong-84	−3.882	−11.068	–
Tahe	Tahe-85	−3.14	−12.89	–
	Tahe-86	−2.78	−12.91	–
	Tahe-87	−1.88	−11.64	–
	Tahe-88	−1.58	−11.09	–
	Tahe-89	−3.19	−12.09	–
	Tahe-90	−1.56	−7.23	–
	Tahe-91	−2.82	−11.19	–
	Tahe-92	−4.62	−12.46	–
	Tahe-93	−5.9	−10.73	–
	Tahe-94	−5.47	−10.55	–
	Tahe-95	−5.62	−10.93	–
	Tahe-96	−0.39	−7.34	–
	Tahe-97	−2.23	−21.21	–
	Tahe-98	−2.17	−21.05	–
	Tahe-99	−2.09	−14.01	–
	Tahe-100	−2.07	−14.3	0.709525
	Tahe-101	−2.26	−14.46	0.709543
	Tahe-102	−1.41	−15.02	0.709602
	Tahe-103	−1.75	−14.29	0.709689
	Tahe-104	−2.52	−14.28	0.709584
	Tahe-105	−0.08	−12.29	0.709352
	Tahe-106	0.17	−12.48	0.709342
	Tahe-107	−2.01	−14.7	–
	Tahe-108	−1.96	−14.71	–
	Tahe-109	−1.97	−14.11	–
	Tahe-110	−1.49	−13.8	–
	Tahe-111	−0.99	−13.91	–
	Tahe-112	−1.21	−13.9	–
	Tahe-113	−1.14	−10.29	0.709463
	Tahe-114	0.41	−8.7	0.709356
	Tahe-115	2.72	−11.15	–
	Tahe-116	3.33	−9.41	–
	Tahe-117	0.75	−7.47	–
	Tahe-118	3.2	−6.44	0.709003
	Tahe-119	2.47	−10.93	–
	Tahe-120	3.02	−7.89	0.70935
	Tahe-121	3.34	−9.61	–

(*continued*)

Table S1. Continued

Area	Sample Number	$\delta^{13}C$‰	$\delta^{18}O$‰	$^{87}Sr/^{86}Sr$
	Tahe-122	2.46	−11.74	–
	Tahe-123	2.42	−7.86	–
	Tahe-124	2.15	−9.71	–
	Tahe-125	1.7	−6.73	0.708291
	Tahe-126	0.48	−11.05	0.708844
	Tahe-127	1.68	−6.79	0.707967
	Tahe-128	1.32	−7.59	–
	Tahe-129	0.5	−6.4	0.709248
	Tahe-130	−8.25	−12.66	–
	Tahe-131	−0.837	−9.48	–
	Tahe-132	−2.27	−9.824	–
	Tahe-133	−1.815	−16.82	–
	Tahe-134	−1.577	−9.401	–
	Tahe-135	−2.955	−12.279	–
	Tahe-136	−1.039	−8.312	–
	Tahe-137	−1.291	−11.619	–
	Tahe-138	−4.261	−14.168	–
	Tahe-139	−3.213	−12.771	–
	Tahe-140	−3.212	−13.444	–
	Tahe-141	−5.36	−14.91	–
	Tahe-142	−1.83	−11.222	–
	Tahe-143	−1.28	−5.135	–
	Tahe-144	−4.048	−10.884	–
	Tahe-145	−3.047	−8.097	–
	Tahe-146	−2.004	−5.318	–
	Tahe-147	0.885	−6.809	–
Shunnan	Shunnan-148	0.19	−6.58	0.70875
	Shunnan-149	0.48	−6.67	–
	Shunnan-150	0.28	−4.6	–
	Shunnan-151	0.28	−7.32	–
	Shunnan-152	0.22	−5.82	–
	Shunnan-153	0.32	−5.73	–
	Shunnan-154	−0.02	−7.24	–
	Shunnan-155	0.08	−8.31	–
	Shunnan-156	−0.24	−7.76	0.7089
	Shunnan-157	−0.34	−9.46	–
	Shunnan-158	0.24	−9.97	–
	Shunnan-159	−2.22	−12.94	0.70911
	Shunnan-160	−2.22	−9.61	0.70913
	Shunnan-161	−2.18	−12.49	0.70917
	Shunnan-162	−0.44	−10.91	0.7097
	Shunnan-163	−2.48	−13.26	0.70897
	Shunnan-164	−1.98	−10.83	0.70958
	Shunnan-165	−1.82	−11.09	0.70972
	Shunnan-166	−1.93	−10.66	0.70949
Halahatang	Halahatang-167	−3.79	−15.17	–
	Halahatang-168	−0.47	−11.74	–
	Halahatang-169	−3.44	−13.13	–
	Halahatang-170	−3.81	−11.92	–
	Halahatang-171	1.16	−5.8	–
	Halahatang-172	−0.31	−14.54	–

(*continued*)

Table S1. Continued

Area	Sample Number	$\delta^{13}C$‰	$\delta^{18}O$‰	$^{87}Sr/^{86}Sr$
	Halahatang-173	−0.42	−14.71	–
	Halahatang-174	−3.25	−13.08	–
	Halahatang-175	1.59	−10.19	–
	Halahatang-176	−2.01	−11.33	–
	Halahatang-177	0.06	−15.71	–
	Halahatang-178	−1.92	−9.25	–
	Halahatang-179	−1.63	−12.25	–
	Halahatang-180	−4.09	−12.71	–
	Halahatang-181	−1.34	−8.61	–
	Halahatang-182	−0.59	−9.54	–
	Halahatang-183	−0.32	−13.51	–
	Halahatang-184	−1.35	−14.26	–
	Halahatang-185	0.34	−13.92	–
	Halahatang-186	1.98	−4.51	–
	Halahatang-187	−3.12	−10.25	–
	Halahatang-188	2.12	−6.51	–
	Halahatang-189	−0.52	−7.57	–
	Halahatang-190	−0.78	−6.37	–
	Halahatang-191	−0.86	−6.91	–
	Halahatang-192	0.12	−8.63	–
	Halahatang-193	0.27	−7.38	–
	Halahatang-194	0.12	−6.04	–

The $\delta^{13}C$, $\delta^{18}O$ isotopic values and $^{87}Sr/^{86}Sr$ ratios of various types of diagenetic carbonates in the Ordovician reservoirs at different oil fields and outcrops are mainly compiled from the previous studies (i.e., Jia et al., 2015, 2016; Jiang et al., 2015; Lu et al., 2017; Baqués et al., 2020; Zhang et al., 2023).
Abbreviation: – = data not measured or unavailable.

Table S2. Paired $\delta^{13}C$ and $\delta^{18}O$ Compositions, Measured Δ_{47} and Converted to Temperatures, and Calculated Fluid $\delta^{18}O$ Values for Cave- and Fracture-Filling Carbonates from the Ordovician of the Tarim Basin, Northwestern China

Sample	Mineral	$\delta^{13}C$‰	$\delta^{18}O$‰	Δ_{47}	T, °C	^{18}O-H_2O, VSMOW
H1	Cave calcite	−3.524	−12.862	0.557	84	−0.6
H6	Fracture calcite	−3.104	−12.909	0.558	83	−0.7
H601-1	Fracture calcite	0.426	−8.822	0.58	70.8	1.6
ZG518	Vug calcite	0.31	−10.78	0.481	138.8	8.3
TZ12	Fracture calcite	−1.293	−8.041	0.524	104.9	7.1
TZ122	Vug calcite	1.198	−8.62	0.53	101	6
TZ166	Fracture calcite	−11.639	−9.899	0.55	87.9	3
TZ721	Fracture calcite	1.059	−8.401	0.515	111.4	7.6
TZ721-8H	Vug calcite	1.063	−7.662	0.546	90.6	5.6
TZ70	Fracture calcite	−0.197	−9.398	0.545	91.2	4
ZG9	Dolomite	0.937	−7.043	0.457	97.8	4.4
GC4	Dolomite	−0.548	−10.162	0.559	62.8	−3.6
DH12	Dolomite	−0.852	−6.36	0.583	55.9	−0.9
TZ243	Dolomite	−1.004	−8.495	0.394	126.1	6
GC8	Dolomite	−1.224	−7.977	0.372	137.8	7.6

Abbreviations: Δ_{47} = clumped CO_2 isotope; T = temperature; VSMOW = Vienna standard mean ocean water.

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