

Supplementary file

Movable oil content evaluation in low-to-medium maturity lacustrine shale during *in-situ* conversion

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Bai, G., Chen, G., Cai, Z., Yan, H., Lu, S., Radwan, A. E. Movable oil content evaluation in low-to-medium maturity lacustrine shale during in-situ conversion. Advances in Geo-Energy Research, 2025, 16(1): 77-90.

The link to this file is: <https://doi.org/10.46690/ager.2025.04.08>

Table S1. Depths of shale samples from Wells S352 and A17.

Well name	Sample numbers	Depths (m)
S352	1, 2, 3, 4, 5	3,195.00, 3,237.14, 3,275.59, 3,338.33, 3,311.31
	6, 7, 8, 9, 10	3,238.73, 3,285.70, 3,288.46, 3,280.50, 3,294.10
	11, 12, 13, 14	3,184.87, 3,194.00, 3,315.35, 3,317.29
A17	1, 2	2,472.26, 2,470.26

Table S2. Parameters used in the simulations (Bai et al., 2024; Wang et al., 2019).

Parameters	Siltstone	Shale	Mudstone	Pore fluid
ρ (kg/m ³)	2,550	2,650	2,580	937.5
C (J/(kg·K))	1,010	1,000	1,190	1,822
k (W/(m·k))	1.20	Parallel: $1.176 \times 10^{-6} T^2 - 0.00285 T + 1.9381$; Perpendicular: $4.563 \times 10^{-6} T^2 - 0.00119 T + 0.7581$	0.96	1.98

Table S3. Statistical results of geochemical parameters of the samples.

Well name	No.	R_o (%)	TOC (%)	T_{max} (°C)	S_1 (mg/g)	S_2 (mg/g)	TOC' (%)	T_{max}' (°C)	S_1' (mg/g)	S_2' (mg/g)	$S_1+\Delta S_2$ (mg/g)	OSI
S352	1	0.86	9.11	452	4.85	37.26	7.77	451	0.10	27.06	15.05	53.24
	2	0.98	8.49	460	1.59	36.52	8.17	453	0.15	34.73	3.38	18.73
	3	0.72	0.81	442	0.50	3.42	0.59	445	0.03	1.30	2.62	61.73
	4	0.78	0.47	446	0.22	1.90	0.33	447	0.03	0.51	1.61	46.81
	5	0.86	5.23	452	1.29	23.42	4.48	452	0.07	16.94	7.77	24.67
	6	0.82	3.41	448	1.08	16.52	2.83	450	0.18	15.34	2.26	31.67
	7	0.82	1.18	437	2.68	5.39	0.62	446	0.04	1.25	6.82	227.12
	8	0.80	5.89	456	1.59	28.53	5.12	455	0.09	22.93	7.19	26.99
	9	0.65	1.08	437	0.45	4.79	0.78	442	0.03	1.86	3.38	41.67
	10	0.92	2.67	449	0.83	12.48	2.09	455	0.07	7.41	5.9	31.09
	11	0.89	6.54	454	5.23	29.24	5.39	450	0.06	18.99	15.48	79.97
	12	0.86	9.46	452	5.72	40.17	8.29	452	0.06	30.18	15.71	60.47
	13	0.95	7.97	458	1.15	30.84	7.72	458	0.11	30.04	1.95	14.43
	14	0.92	7.42	456	1.31	29.75	7.05	452	0.18	26.28	4.78	17.65
A17	2	0.54	12.99	446	3.04	57.77	12.25	449	0.38	50.04	10.77	23.40
	3	0.7	12.10	441	0.53	97.17	11.80	441	0.31	95.97	1.73	4.38
	4	0.9	11.50	446	0.92	81.43	10.40	447	0.14	79.30	3.05	8.00
	5	1.1	8.99	448	1.21	16.20	7.72	446	0.24	12.70	4.71	13.46
	6	1.3	8.19	452	0.62	5.55	7.54	454	0.12	4.56	1.61	7.57
	7	1.7	7.59	551	0.52	1.45	7.32	555	0.20	1.73	0.24	6.85
	8	2.5	7.28	571	0.56	0.51	6.98	584	0.27	0.51	0.56	7.69

Table S4. Statistical results of signal amplitudes of NMR T_1 - T_2 map and oil content of the samples.

Well name	Sample number	Signal amplitude (a.u./g rock)				Oil content (mg/g rock)	Oil content/TOC' (mg/g TOC)
		Kerogen	Bound oil	Free oil	Total oil		
S352	1	114.22	16.39	71.18	87.57	10.12	1.3
	2	145.12	56.95	69.58	126.53	13.43	1.64
	3	10.46	9.94	3.68	13.62	1.76	2.99
	4	7.28	7.09	4.09	11.18	1.05	3.15
	5	73.46	19.07	36.89	55.96	6.46	1.44
	6	67.01	0	10.83	10.83	1.29	0.46
	7	10.26	0	10.37	10.37	1.24	2
	8	97.59	75.88	59.61	135.49	16.4	3.21
	9	0	22.58	0	22.58	3.23	1.88
	10	59.05	9.31	12.26	21.57	2.39	1.14
	11	68.03	76.05	80.66	156.71	17.71	3.29
	12	17.77	102.87	73.03	175.9	17.97	2.45
	13	137.43	58.05	31.64	89.69	9.72	1.26
	14	102.3	69.67	0	69.67	7.7	1.09
A17	2	11.37	33.27	0	33.27	5.19	0.42
	3	8.86	36.46	10.04	46.5	6.14	0.52
	4	20.78	111.71	38.22	149.93	16.82	1.62
	5	11.91	32.75	121.43	154.18	15.19	1.97
	6	4.59	26.77	5.28	32.05	2.83	0.38
	7	17.91	12.4	15.15	27.55	2.05	0.28
	8	0	0	0	0	0	0

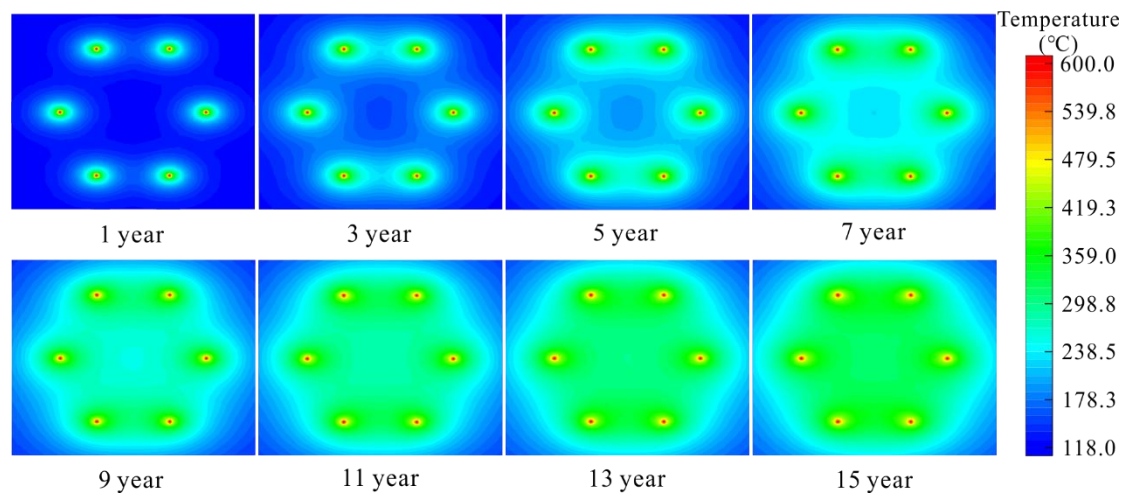


Fig. S1. Temperature distribution and evolution within the reservoir in the lower part of the numerical model during in-situ conversion.

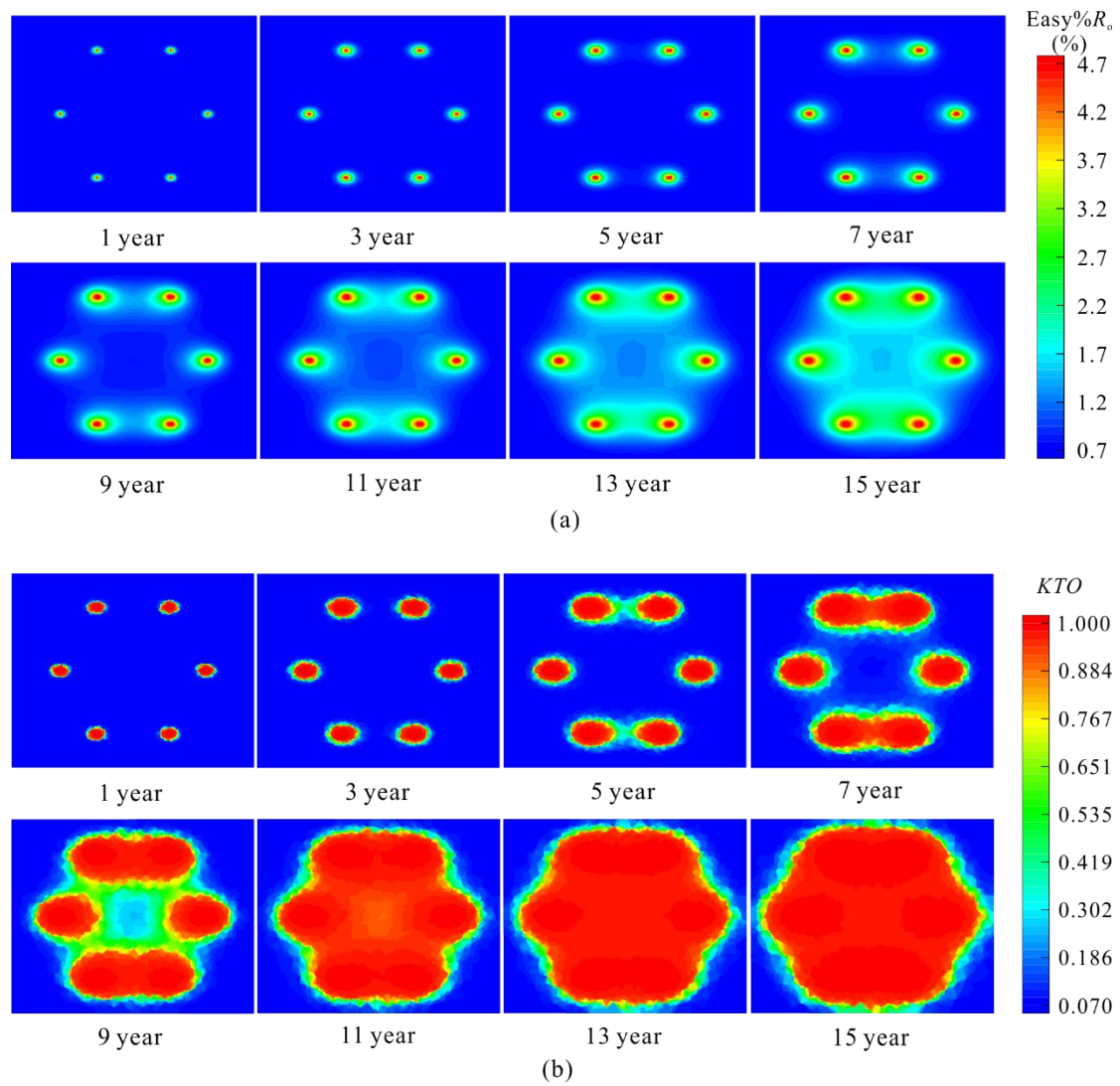


Fig. S2. Distribution and evolution of maturity and oil generation conversion rate during in-situ conversion in the upper part of the numerical model. (a) maturity and (b) oil generation conversion rate.