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Supplementary data

Table S1. Mg, Mn, Fe and Sr contents in ppm of the karst fills and host carbonates in the Casablanca and Amposta oil wells and in the Penedès Basin.

Studied area	Description		Mg (ppm)	Mn (ppm)	Fe (ppm)	Sr (ppm)	n
Casablanca-1A oil well							
		Max	122215	d.l.	2950	479	
	Dolomite 1	Min	118742	d.l.	2514	397	3
		Med	120659	-	2701	452	
		Max	128604	d.l.	8341	677	
	Dolomite 2a	Min	118800	d.l.	d.l.	d.l.	30
		Med	124515	-	d.l.	419	
		Max	122661	d.l.	7051	672	
	Dolomite 2b	Min	119000	d.l.	1959	d.l.	34
		Med	122545	-	3496	416	
Amposta Marino C2 oil well							
		Max	1013	d.l.	1813	355	
	Lower Cretaceous limestones	Min	4909	d.l.	d.l.	1407	15
		Med	3081	-	821	908	
		Max	2619	d.l.	721	640	
	CS3r	Min	4038	d.l.	d.l.	1053	9
		Med	3426	-	531	863	
		Max	1052	d.l.	2701	491	
	CS3g	Min	5461	d.l.	d.l.	1259	9
		Med	3692	-	1521	866	
Penedès Basin							
Castellví		Max	130202	d.l.	1191	316	
	RD1	Min	125280	d.l.	219	129	4
		Med	127371	-	543	206	
		Max	120843	235	6927	1250	
	DS2	Min	105966	d.l.	52	177	54
		Med	113550	169	1186	748	
		Max	120083	346	2866	1228	
	DS3	Min	107265	115	213	237	32
		Med	114518	183	1002	740	
		Max	3620	128	2885	686	
	CS1	Min	1915	d.l.	212	292	8
		Med	2831	-	972	440	
Olèrdola	Host limestones	Max	5103	478	1253	d.l.	
		Min	231	191	578	d.l.	42
		Med	2738	231	851	-	
	CS2	Max	1672	287	916	d.l.	
		Min	923	239	530	d.l.	7
		Med	1396	307	771	-	
	CS3	Max	3200	478	1784	d.l.	
		Min	2018	239	627	d.l.	5
		Med	2808	325.2	1350	-	
Montjuïc		Max	2652	126	1127	444	
	Host limestones	Min	2020	108	1078	430	2
		Med	2336	117	1102.5	437	
		Max	1602	d.l.	2056	297	
	OP1	Min	522	d.l.	478	179	5
		Med	1271.2	-	1176	222	

Table S2. $\delta^{18}O$ and $\delta^{13}C$ values of the karst fills and host carbonates of the Casablanca and Amposta oil wells and of the Penedès Basin.

Studied area	Sample	Description	$\delta^{13}C$ PDB	$\delta^{18}O$ PDB
Casablanca oil well				
	RM-20.1	Dolomite 1	-8.8	+1.2
	RM-30.3	Dolomite 1	-7.6	+1.7
	RM-30.4	Dolomite 1	-9.7	+1.1
	RM-47.4	Dolomite 1	-10.8	+1.2
	RM-12.2	Dolomite 2a	-10.4	+1.1
	RM-13.2	Dolomite 2a	-6.8	+1.9
	RM-16.2	Dolomite 2a	-9.8	+1.0
	RM-32.3	Dolomite 2a	-8.9	+1.2
	RM-24.3	Dolomite 2a	-9.4	+2.0
	RM-30.2	Dolomite 2a	-10.3	+1.0
	RM-29.4	Dolomite 2a	-6.9	+2.4
	RM-47.3	Dolomite 2a	-9.3	+1.1
	RM-12.1	Dolomite 2b	-6.1	+1.3
	RM-12.4	Dolomite 2b	-6.3	+1.3
	RM-13.1	Dolomite 2b	-7.73	+1.1
	RM-32.1	Dolomite 2b	-6.8	+1.1
	RM-32.2	Dolomite 2b	-6.8	+1.1
	RM-31.1	Dolomite 2b	-6.5	+1.0
	RM-19.4	Dolomite 2b	-2.3	+1.4
	RM-16.1	Dolomite 2b	-8.3	+1.2
	RM-16.5	Dolomite 2b	-8.3	+1.2
	RM-17.2	Dolomite 2b	-9.3	+1.1
	RM-17.6	Dolomite 2b	-9.6	+1.1
	RM-47.1	Dolomite 2b	-7	+1.1
	RM-47.2	Dolomite 2b	-7.2	+1.1
	RM-46.1	Dolomite 2b	-7.4	+1.2
	RM-30.5	Dolomite 2b	-9.1	+0.9
Amposta Marino C2 well				
	6d	Lower Cretaceous limestones	-2.2	+1.1
	6e	Lower Cretaceous limestones	-2.3	+1.1
	14c	Lower Cretaceous limestones	-3.9	+1.5
	15g	Lower Cretaceous limestones	-2.7	+1.4
	18d	Lower Cretaceous limestones	-4.2	+0.9
	18e	Lower Cretaceous limestones	-3.5	+1.2
	19b	CS3r	-5.8	-0.40
	19c	CS3r	-8.9	+0.3
	8i	Cs3g	-5.8	-0.1
	8j	Cs3g	-8.7	-0.6
	12a	Cs3g	-8.6	0
	15a	Cs3g	-5.9	-1.2
	15f	Cs3g	-4.1	-0.6
	15h	Cs3g	-4.1	-0.3
	16b	Cs3g	-4.4	+0.5
Penedès Basin				
Castellví	VCBJ-1c	RD1	+0.7	+0.1
	VCBJ -2Ac	RD1	+2.3	+0.3
	VCBJ -2Bb	RD1	+2.1	+1.2
	VCBJ -6Ac	RD1	+1.5	+0.3

	VCBJ -6Ad	RD1	+1.8	+0.9
	VCBJ -7a	RD1	+2.0	+0.5
	VCBJ -8a	RD1	+1.7	+0.8
	VCBJ -1d	RD1	+0.4	-2.4
	VCBJ -1e	RD1	+2.1	-1.8
	VCBJ -2Aa	RD1	-0.1	-0.9
	VCBJ -2Ab	RD1	+1.2	-0.4
	VCBJ -2Bc	RD1	-0.5	-1.8
	VCBJ -3Ac	RD1	+1.0	-1.6
	VCBJ -3Bd	RD1	+1.0	-1.8
	VCBJ -3Bf	RD1	+0.5	-2.2
	VCBJ -4d	RD1	+0.3	-1.5
	VCBJ -5f	RD1	+1.1	-1.8
	VCG 5b	RD1	+1.9	-1.1
	VCG 7a	RD1	+0.8	-1.6
	VCG 7b	RD1	+1.3	-2.1
	VCG 10Ac	RD1	+1.3	-1.7
	VCG 11c	RD1	+0.9	-1.1
	VCV-19 Bb	DS2	-3.8	-1.6
	VCV-19 Cd	DS2	-4.2	-1.4
	VCV-20 Ae	DS2	-3.0	-0.8
	VCV-20 Af	DS2	-3.2	-0.9
	VCV-20 Be	DS2	-3.8	-1.1
	VCV-20 Ac	DS2	-3.6	-1.0
	VCV-8g	DS2	-3.7	-1.1
	VCV-20 Bc	DS2	-4.0	-1.3
	VCV-20 Bd	DS2	-3.6	-1.2
	VCV-20 Ag	DS2	-3.9	-1.4
	VCV-17 Bb	DS3	-1.9	-0.1
	VCV-19 Bd	DS3	-1.3	+0.7
	VCV-19 Be	DS3	-1.1	+0.5
	VCV-20 Ab	DS3	-2.0	-2.0
	VCV-15 Ba	DS3	-1.3	-0.9
	VCV-5 Bc	CS1	-7.7	-8.5
	VCV-5 Bd	CS1	-7.8	-8.6
	VCV-6A-1	CS1	-7.6	-8.6
Olèrdola	KO 2c	Host limestones	+1.2	-4.9
	KO 3b	Host limestones	+1.5	-4.5
	KO 1c	Host limestones	+0.4	-5.4
	KO 2b	CS2	-4.7	-6.3
	KO 1a	CS2	-4.4	-5.9
	KO 2b	CS3	-3.6	-3.8
	KO 3a	CS3	-3.2	-4.2
	KO 1b	CS3	-4.1	-3.8
Montjuïc	VMJ-6Bb	Host limestones	-4.0	-4.3
	VMJ-1c	Host limestones	-5.3	-5.3
	VMJ-3(D)	Host limestones	-4.6	-4.0
	VMJ-3A5	Host limestones	-4.9	-4.3
	VMJ-3B1	Host limestones	-5.6	-4.3
	VMJ-6Aa	Host limestones	-5.4	-3.3
	VMJ-6Ba	Host limestones	-5.8	-3.3
	VMJ-7Cc	Host limestones	-4.7	-3.0
	VMJ-14Ab	OP1	-9.0	-4.7
	VMJ-11'-a	OP1	-9.4	-4.7
	VMJ-11Bb	OP1	-8.5	-4.9
	VMJ-12Ac	OP1	-8.5	-4.9

VMJ-14Ac	OP1	-8.9	-4.7
VMJ-14Ba	OP1	-9.5	-4.5
VMJ-17b	OP1	-9.1	-4.4
VMJ-17d	OP1	-10.3	-7.1

Table S3. $^{87}Sr/^{86}Sr$ ratios of the karst fills and host carbonates of the Casablanca and Amposta oil and of the Castellví outcrop in the Penedès Basin.

Scheme 87.	Sample	Description	$^{87}Sr/^{86}Sr$
Casablanca oil well			
	RM-32b	Dolomite 2a	0,708607
	RM-32a	Dolomite 2b	0,709202
	RM-47a	Dolomite 2b	0,709137
Amposta Marino C2 well			
	6A	Lower Cretaceous limestones	0,707633
	8B	Lower Cretaceous limestones	0,707524
	18A	Lower Cretaceous limestones	0,707483
	17B	CS3r	0,708699
	19A	CS3r	0,708576
	15A	CS3g	0,708615
Penedès basin			
Castellví	VCBJ-14	RD1	0,707417
	VCV-X	DS2	0,708761
	VCV-20	DS3	0,708855