

Table 2: Physicochemical parameters of the tank and carbonate freshwater aquifer measured during the baseline and the CO₂ injection experiment.

1) For baseline values: a) the 2nd and 3rd lines show the pH and electrical conductivity ($\mu\text{S}\cdot\text{cm}^{-1}$) measured by conductivity and pH-meter before and after addition of a gas mixture (90% of CO₂, 9% of He, and 1% of Kr) in the tank; b) the other lines show the carbonate freshwater aquifer baseline of the different physico-geochemical parameters (electrical conductivity ($\mu\text{S}\cdot\text{cm}^{-1}$), pH, ORP (mV), CO₂ concentration (%)) measured before CO₂ injection by the multiparameter et CO₂ probes on the wells F1, F2, F3, F6 and F8. 2) For CO₂ experience values: the data correspond to the maximum values reached during the injection experiment measured by the multiparameter et CO₂ probes on the wells F1, F2, F3, F6 and F8.

Baseline values		Water tank (before addition of gas mixture)	Well F1	Well F2	Well F3	Well F6	Well F8
	Electrical conductivity ($\pm 0.5\%$ of reading plus $1.0 \mu\text{S.cm}^{-1}$)	649.00	738.48	-	631.98	668.17	734.81
	pH	7.27 ($\pm 0.2\%$)	7.02 (± 0.1 pH units)	-	7.15 (± 0.1 pH units)	7.03 (± 0.1 pH units)	7.10 (± 0.1 pH units)
	ORP (± 5 mV)	-	320.90	-	348.69	233.22	375.58
	[CO ₂] (mg/L $\pm 5\%$)	-	2.46	1.84	1.95	-	2.26
	[Ca ²⁺] (mg/L $\pm 5\%$)	-	156	123	120	124	129
	[HCO ₃ ⁻] (mg/L $\pm 5\%$)	-	317	310	306	325	322
	[Na ⁺] (mg/L $\pm 5\%$)	-	9	12	12	12	12
	[Mg ²⁺] (mg/L $\pm 5\%$)	-	3	3	3	3	3
	[K ⁺] (mg/L $\pm 5\%$)	-	1	1	-	-	-
	[SO ₄ ²⁻] (mg/L $\pm 5\%$)	-	39	48	53	53	53
	[NO ₃ ⁻] (mg/L $\pm 5\%$)	-	20	20	22	23	23
	[Cl ⁻] (mg/L $\pm 5\%$)	-	19	16	18	18	18
CO ₂ experience		Water tank (after addition of gas mixture)	Well F1	Well F2	Well F3	Well F6	Well F8
	Electrical conductivity ($\pm 0.5\%$ of reading plus $1.0 \mu\text{S.cm}^{-1}$)	645.00	1551	-	729	716	777
	pH	5.45 ($\pm 0.2\%$)	5.63 (± 0.1)	-	6.97 (± 0.1)	6.96 (± 0.1)	7.07 (± 0.1)
	ORP (± 5 mV)	-	238	-	-	-	-
	[CO ₂] ($\pm 5\%$)	-	> 20	3.54	3.67	-	2.42

Tables 3: Concentrations of the different cations and anions (mg/L) for wells F1, F2 and F3, measured before the CO₂ injection (ie., the baseline) by ion chromatography. In the second column are reported the maximum concentrations reached after CO₂ intrusion, and the associated dates and times (third column). The fourth column shows the increase in concentrations compared to baseline value (%). The five indicates the time to return to equilibrium values (in days). The time to return to equilibrium values is not indicated for SO₄²⁻, NO₃⁻ and Cl⁻ because these species undergo a second increase or decrease in concentrations 14.5 days after injection.

F1	Natural concentration (baseline) ± 5%	Maximum concentration (mg/L) ± 5%	Day after injection	Increase in concentration compared to baseline value (%)	Time to return to plateau values or baseline (days) after reaching maximum concentration
Ca ²⁺	156	292	0.33	47	0.67
HCO ₃ ⁻	317	833	0.33	62	1.33
Na ⁺	9	26	0.33	65	0.67
Mg ²⁺	3	4	0.33	25	0.34
K ⁺	1	9	0.33	89	3.02
SO ₄ ²⁻	39	67	3.35	43	-
NO ₃ ⁻	20	29	3.35	31	-
Cl ⁻	19	31	0.33	39	-

F2	Natural concentration (baseline) ± 5%	Maximum concentration (mg/L) ± 5%	Day after injection	Increase in concentration compared to baseline value (%)	Time to return to plateau values or baseline (days) after reaching maximum concentration
Ca ²⁺	123	169	1.01	27	2.35
HCO ₃ ⁻	310	401	1.67	23	2.32
Na ⁺	12	13	1.01	8	2.35
Mg ²⁺	3	4	1.01	25	3.64
K ⁺	1	3	1.67	67	2.68
SO ₄ ²⁻	48	69	3.01	30	-
NO ₃ ⁻	20	33	4.65	39	-
Cl ⁻	16	21	1.01	24	-

F3	Natural concentration (baseline) ± 5%	Maximum concentration (mg/L) ± 5%	Day after injection	Increase in concentration compared to baseline value (%)	Time to return to plateau values or baseline (days) after reaching maximum concentration
Ca ²⁺	120	163	3.02	26	2.35
HCO ₃ ⁻	306	371	2.02	18	5.03
Na ⁺	12	13	0.69	8	3.68
Mg ²⁺	3	4	2.02	25	3.98
K ⁺	x	2	1.35	68	6.31
SO ₄ ²⁻	53	69	6.00	23	-
NO ₃ ⁻	22	31	3.66	29	-
Cl ⁻	18	21	7.05	14	-

