

Electronic Supplementary Information

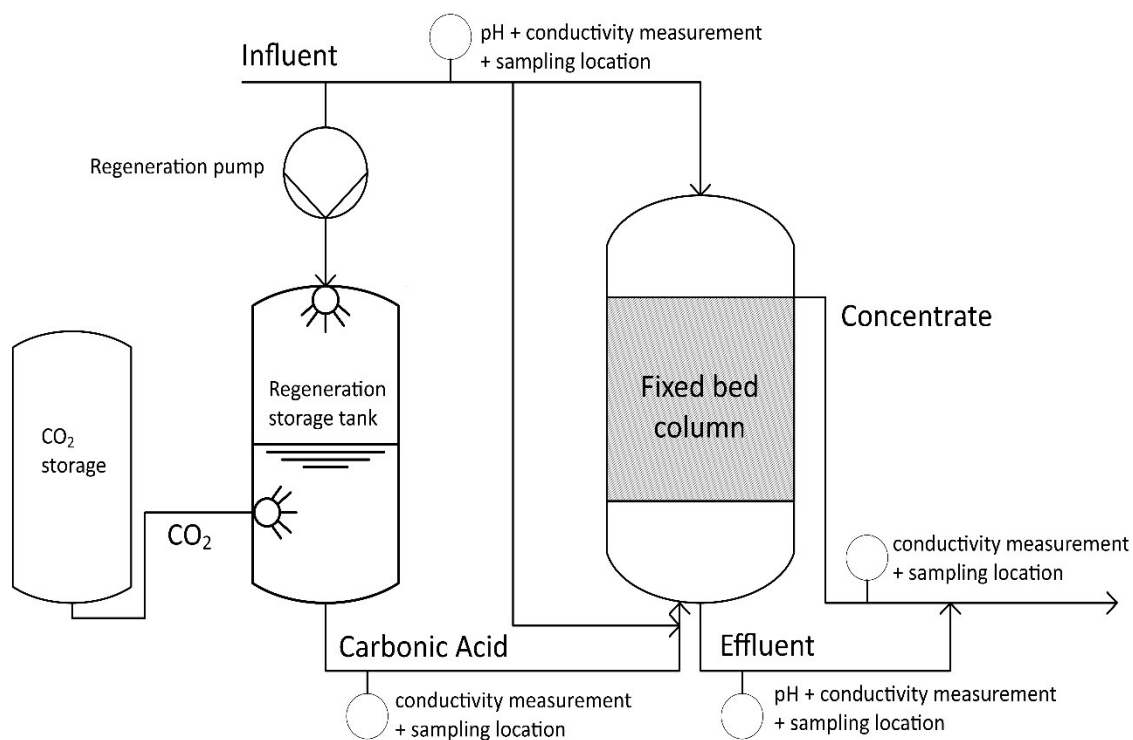


Figure 1: Simplified pilot plant diagram

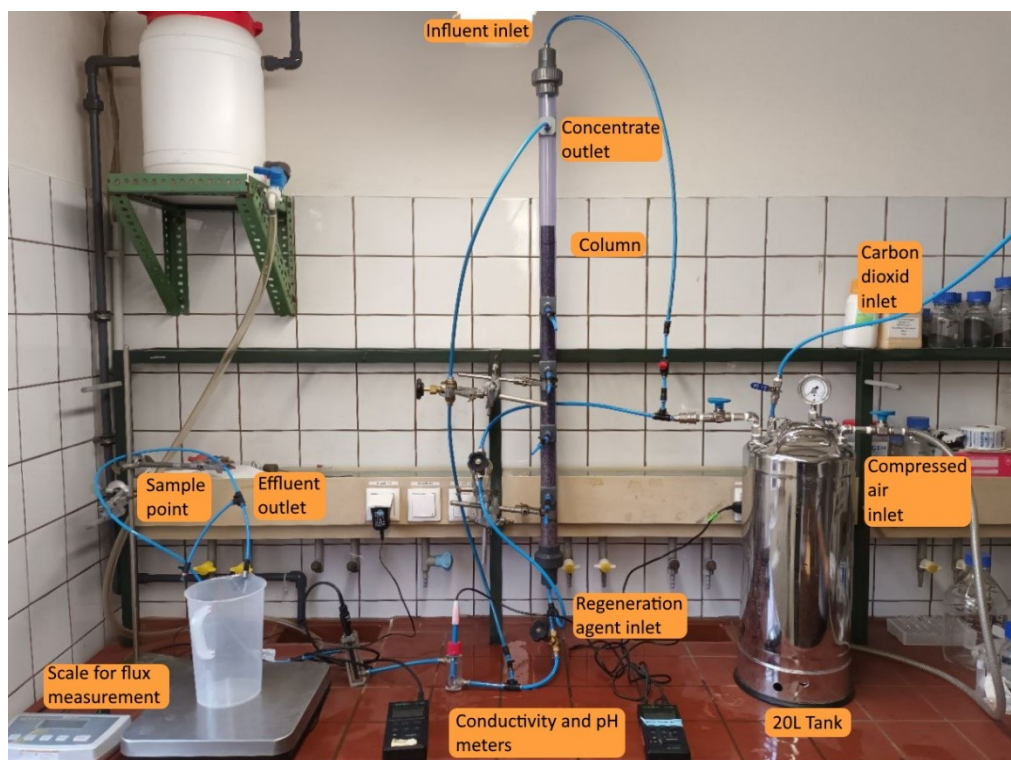


Figure 2: Lab-scale plant

Table 1: Literature full-scale plant data used for regression analysis ¹

Full-scale Plant	A		B		C		D		E	
	Infl.	Effl.	Infl.	Effl.	Infl.	Effl.	Infl.	Effl.	Infl.	Effl.
Calcium in mg/L	134	76	112	70	164	72	185	78	150	63
Magnesium in mg/L	26	16	25	15	27	12	26	11	48	20
Water Hardness in mmol/L	4.43	2,59	3.84	2.38	5.22	2.31	5.71	2.41	5.75	2.41
Alkalinity in mmol/L	6.09	4,00	4.47	2.72	6.70	3.60	6.00	2.50	7.11	3.60
Sulphate in mg/L	90.0	28,0	151.0	101.0	149.0	28.0	135.0	36.0	159.0	28.0
Nitrate in mg/L	42.0	30,0	16.0	14.0	25.0	19.0	40.0	26.0	17.0	11.0
Chloride in mg/L	20.0	15,0	37.0	32.0	38.0	35.0	98.0	69.0	31.0	23.0
Max. influent flow rate in m ³ /h	400		260		170		120		650	
Avg. bypass in m ³ /h	80		0		0		0		0	
Number of Fixed Bed Columns	3		3		3		3		2x3	
Throughput (Service Cycle) in BV	50				50		Unknown		33	
Empty Bed Flow Rate (Service Cycle) in m/h	9-12		16		7		7.5		7-11	
Ratio WAC/SBA per Column in m ³ /m ³	17/21.3		19.7/12.3		18/15		10/10		25/25	
Throughput (Regeneration) in BV	6		5		5.5		5		6	
Empty Bed Flow Rate (Regeneration) in m/h	5		7		3		5		5.3	

References

- 1 DVGW, *Zentrale Enthärtung in der Trinkwasserversorgung - Ionenaustauschverfahren*, Deutscher Verein des Gas- und Wasserfaches, 2012.