Review

Advancements in Exploiting Sporosarcina Pasteurii as Sustainable Construction Material: A Review

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1. Supplementary Materials

Table S 1. Selective examples of literature employing *S. Pasteurii* for soil stabilization via surface percolation and mixing techniques.

Method	Characterization						Treat. Time (Days)	Comments and results	Ref.
	SEM	EDS	XRD	$CaCO_3$ content	Mechanical test (MPa)	Permeability reduction			
Surface Percolation	X	X	X	5.6-33.2	4.8-11.5		4	• 92 hours treatment + 3 weeks curing • $CaCO_3$ crystal morphology were similar for technical and analytical grade cementation solution.	[74]
	X			13 7.5	0.5-2.5 0.5-11.3 0.5-4.8			fine-grained: stiffness 166-1056 MPa medium-grained: 153-1974 MPa natural sand-gravel mixture: 355-1243 MPa	[99]
	X	X		5.7-6.9	0.57		14	• 6 treatment cycles • $CaCO_3$ distribution was better along the sample with fewer fine particulates	[46]
	X				X			• the resistance of treated samples to cyclic stress improved • The relative density increased	[134]
	X	X		2.5-16 1.5-8	0.2-2.3 0.4-1.5	X	16	MICP: E_{50} = 20-250 MPa EICP: E_{50} = 50-200 MPa	[43]
	X	X	X	22	14		14	• 32 treatment cycle • $CaCO_3$ content, dry density, void ratio, and porosity were determined by XCT	[52]
				X			12	• $CaCO_3$ production rates is higher in samples treated with $CaCl_2$ and $Ca(CH_3COO)_2$ than $Ca(NO_3)_2$	[71]
Sprayed	X				X		14	• sand-steel interface shear strength increased 3 to 7 times	[102]
	X			65	0.4		6	• soil's resistance to rainfall simulation improved	[75]
				X	3.6-4.2		30	• $CaCO_3$ content = 270-310 kg/m^3 • mechanical Characterisation done by three-point loading text (flexural strength)	[73]

Mixed				X	0.1-0.2		10	• $CaCO_3$ content = 19.7-82.3 kg/m^3 • UCS values increased by 3 to 6 times	[45]
	X	X		3.2-5.6	0.6	X	14	• CBR test values : 7.5-14 %	[2]
	X		X		X	X	21	• tensile strength increased by 12 kPa	[47]
	X		X	X			12	• the number of crystals produced by natural bacteria in soil is more, but the size of the crystals produced by Sp. Pasteurii is significantly greater	[44]
	X		X		X		5	• CBR = 49 %, moisture content=11.8 %	[7]
	X		X	14	0.8			• The prosity of the sample reduced by 10.6% • Using seawater in solution improved the MICP performance	[103]

* X: Experiment has been performed