

FIG. 1A

Material	CaO	SiO ₂	MgO	Al ₂ O ₃	Fe ₂ O ₃	SO ₃	TiO	Na ₂ O	Others	Loss on ignition
CS	62.82	3.27	0.93	1.53	ND	0.51	0.03	ND	0.24	30.67
GGBS	43.04	28.28	7.02	13.78	0.49	4.23	1.39	0.35	0.94	0.48
Marine clay	1.67	59.85	1.36	18.89	5.34	0.74	1.08	0.78	2.91	7.37

FIG. 1B

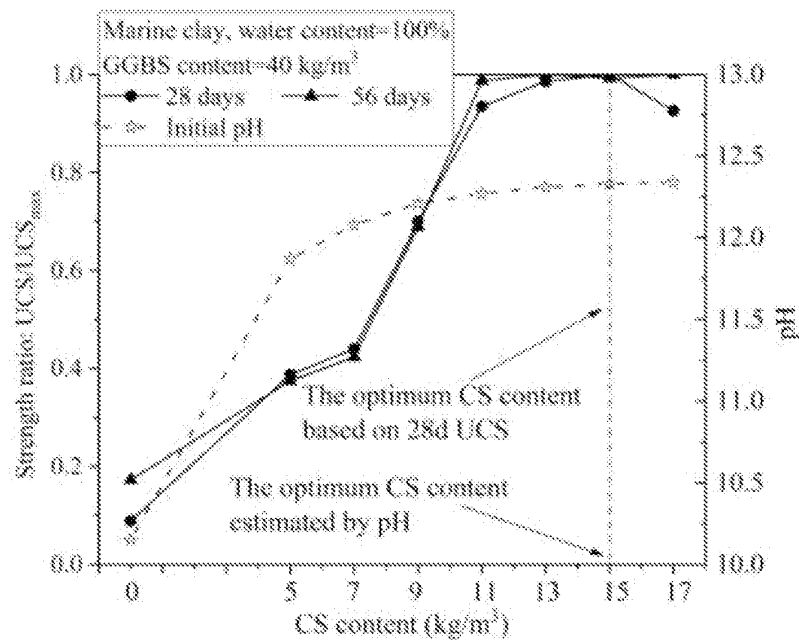


FIG. 1C

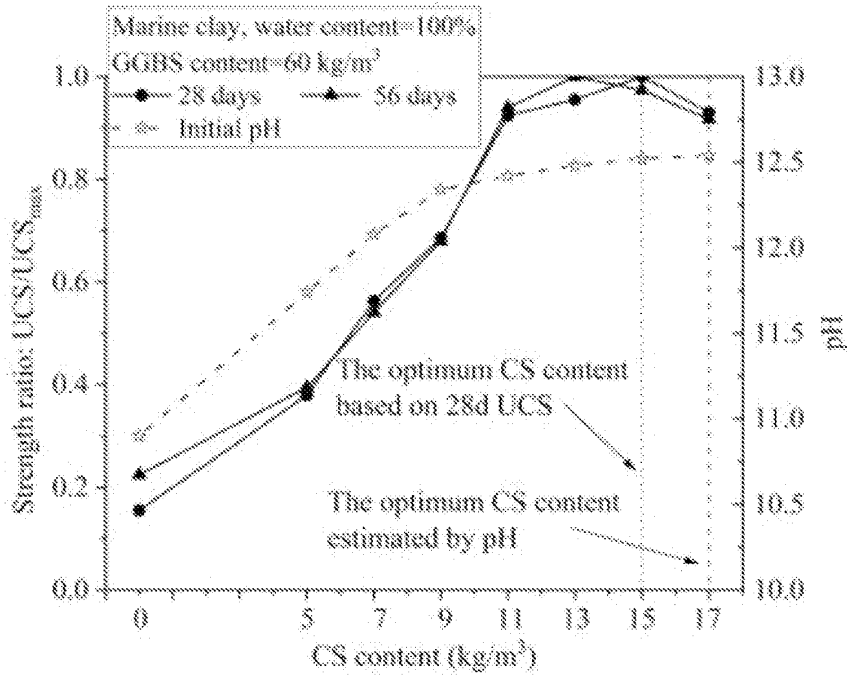


FIG. 1D

Clay type	GGBS content (kg/m ³)	Estimated desirable CS content according to initial pH (kg/m ³)	Corresponding UCS ratio	
			28 days	56 days
Clay slurry	40	15	1	1
	60	17	0.930	0.917

FIG. 1E

Laboratory workload and costs	The present method	Traditional method
Laboratory workload	Four hours, including, mixing, centrifuge extraction, and pH testing.	Ten hours for sample casting; and six hours for sample demolding and UCS testing
Curing periods	None	Up to 56 days
Material consumption	1.4kg clay slurry, 48.8g GGBS, and 10.8g CS	25.2kg clay slurry, 878.6g GGBS, and 194.4g CS
Testing fees	None	Equipment charging of \$S 120.0 for the UCS test in the lab

FIG. 2A

Soil	Water content	Alkaline		GGBS content	Lime/CS-to-GGBS ratio
		Type	Content		
Engelay Lower Oxford clay	130%	Hydrated lime	5-10%	5-25%	20% at 28 days
Silty sand soil	40%	Quicklime	4-14%	6-16%	25% at 28 days
Clayey silt	20%	Hydrated lime	1, 3, and 5%	5-15%	33% at 7 days; and 20% at 28 days
Marine clay	40%	Hydrated lime	1-8%	10-15%	11% at 28 days
	60%	Quicklime and hydrated lime	0.625%-5%	12.5%	20% at 7 and 28 days; and 10% at 90 days
Marine clay	60%	CS	1-12%	20-30%	25% at 7 and 28 days; and 20% at 90 days for GGBS content of 20% 20% at 7 days; 15% at 28 days; and 90 days for GGBS content of 30% 25% for quicklime-GGBS; and 33% for CS-GGBS at 28 days
Dredged sludge	70%	Quicklime and CS	1-6%	7-27%	

FIG. 2B

Material	CaO	SiO ₂	MgO	Al ₂ O ₃	Fe ₂ O ₃	SO ₃	TiO	Na ₂ O	Others	Loss on ignition
CS	62.82	3.27	0.93	1.53	ND	0.51	0.03	ND	0.24	30.67
GGBS	43.04	28.28	7.02	13.78	0.49	4.23	1.39	0.35	0.94	0.48
OPC	62.13	20.77	4.11	3.66	2.93	1.76	0.69	0.37	0.58	3.00
Marine clay	1.67	59.85	1.36	18.89	5.34	0.74	1.08	0.78	2.91	7.37
Kaolin	0.06	64.70	0.80	30.17	ND	0.05	0.50	0.04	3.68	0
Bentonite	8.60	40.99	11.54	5.79	3.28	0.22	0.41	0.34	1.13	13.95

FIG. 2C

Clay type	Water content (%)	CS content (kg/m ³)	GBS content (kg/m ³)	Curing period (days)	Tests
Marine clay	100		40 and 60		The pH and strength at all curing ages.
Kaolin	80	0, 5, 7, 9, 11, 13, 15, 17	40	7, 28, and 56	Water content of treated marine clay slurry at 7 and 56 days.
K9B1	150		60		XRD and TGA of treated marine clay slurry at 56 days.

FIG. 3A

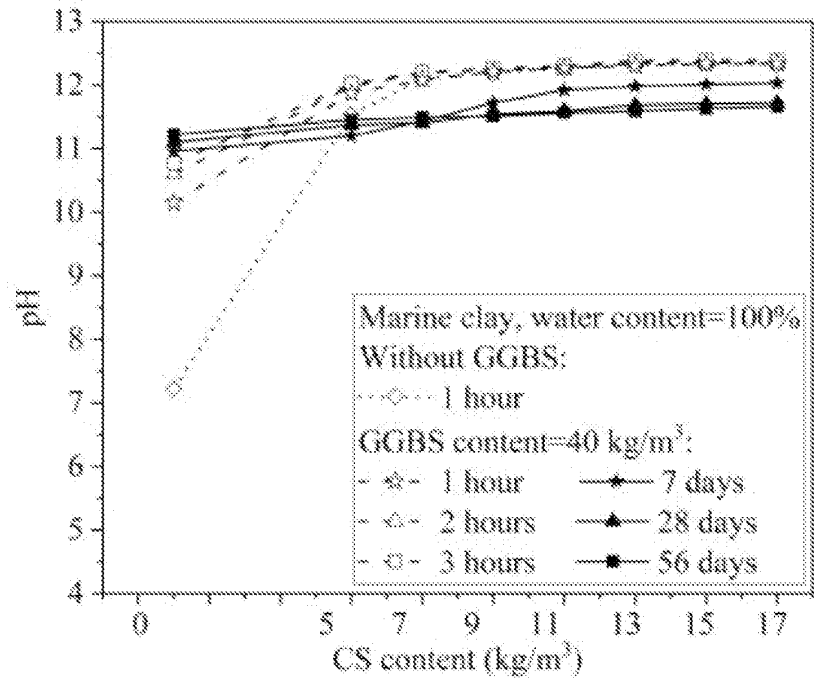


FIG. 3B

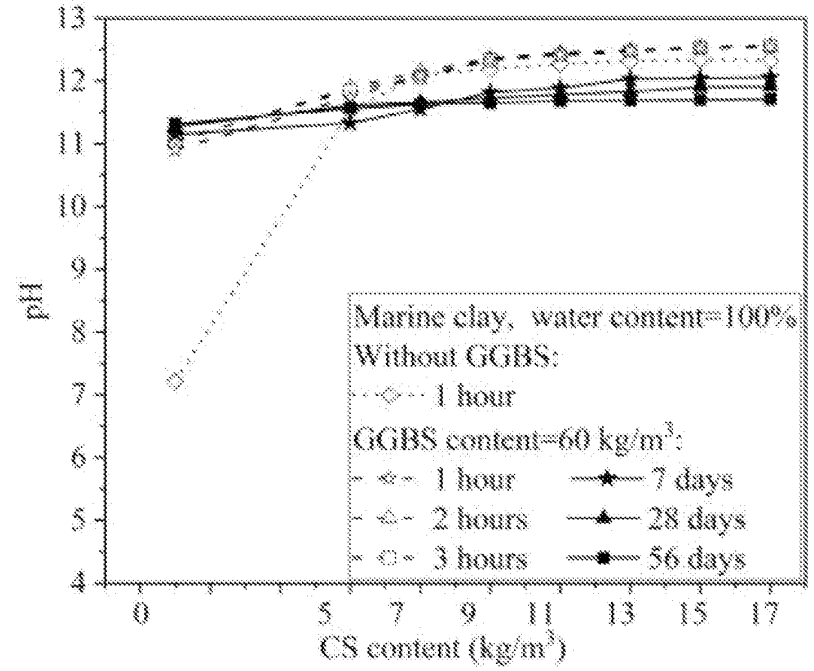


FIG. 3C

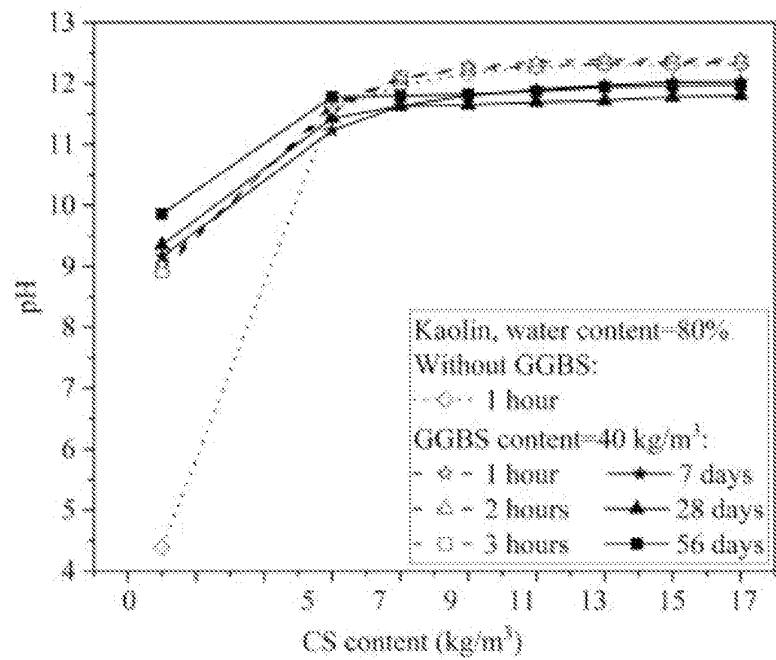


FIG. 3D

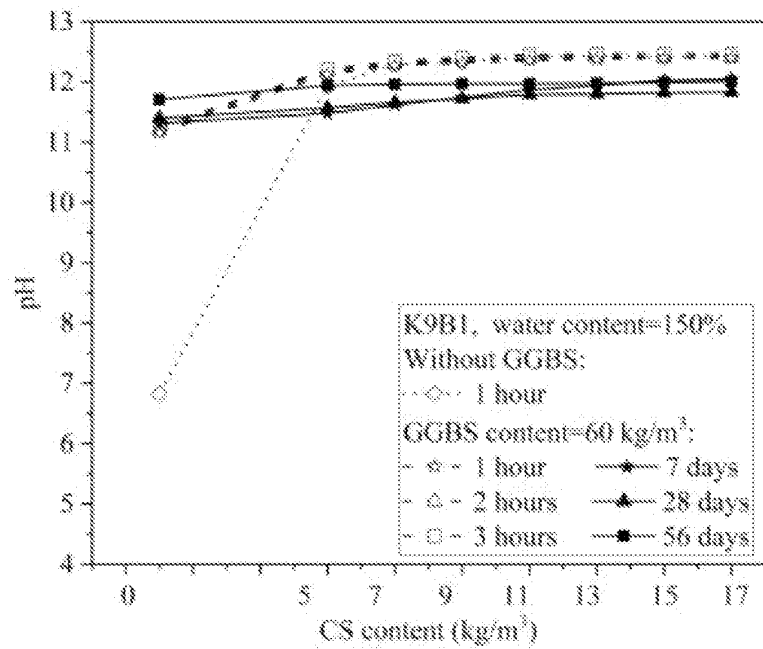


FIG. 4A

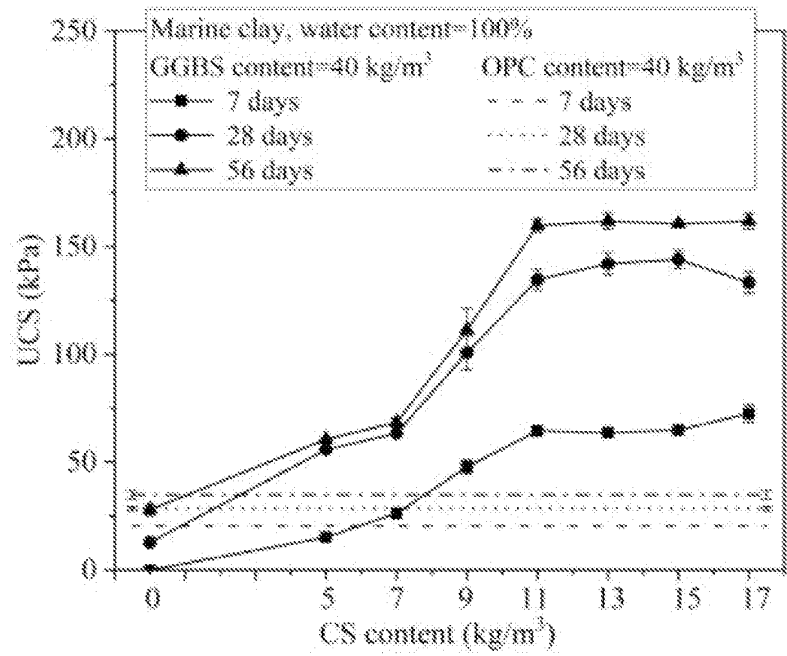


FIG. 4B

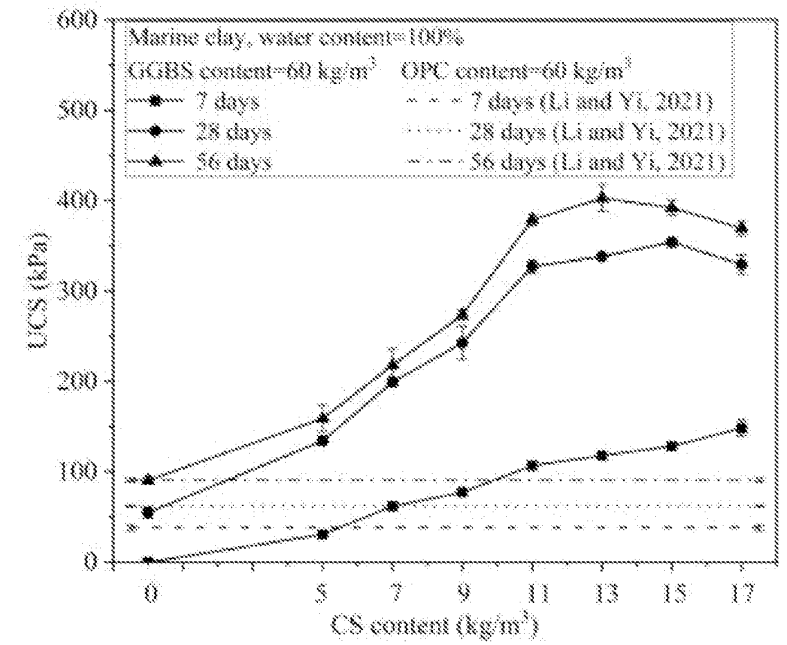


FIG. 4C

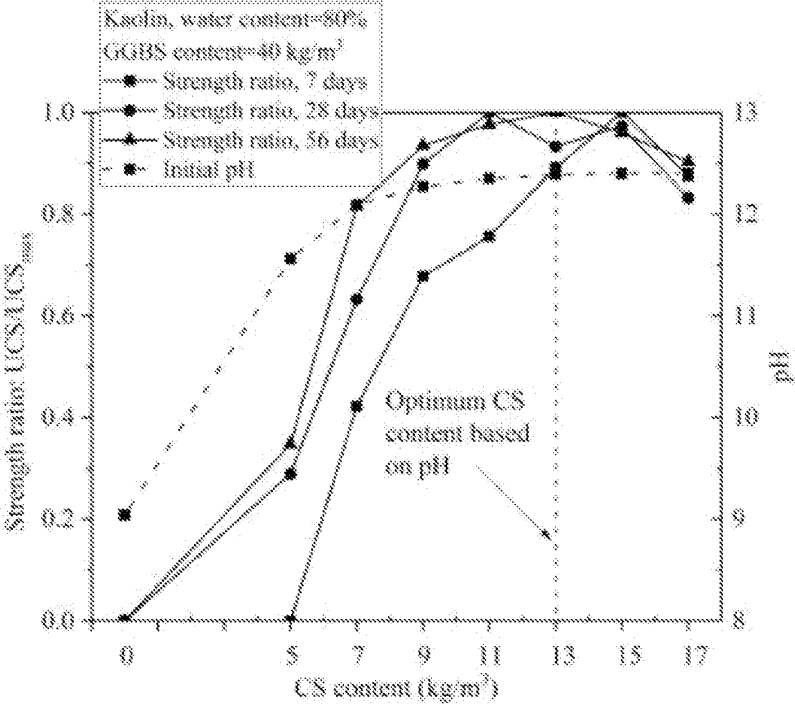


FIG. 4D

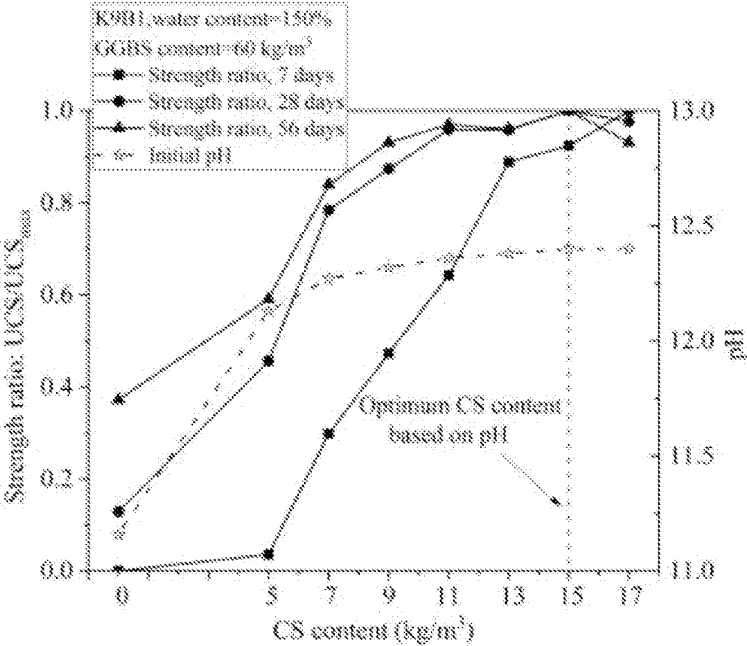


FIG. 5A

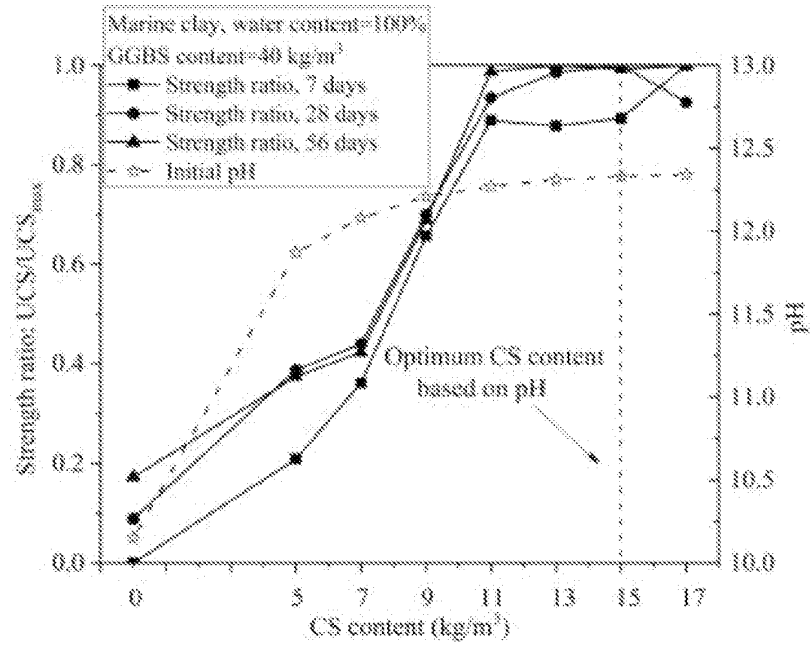


FIG. 5B

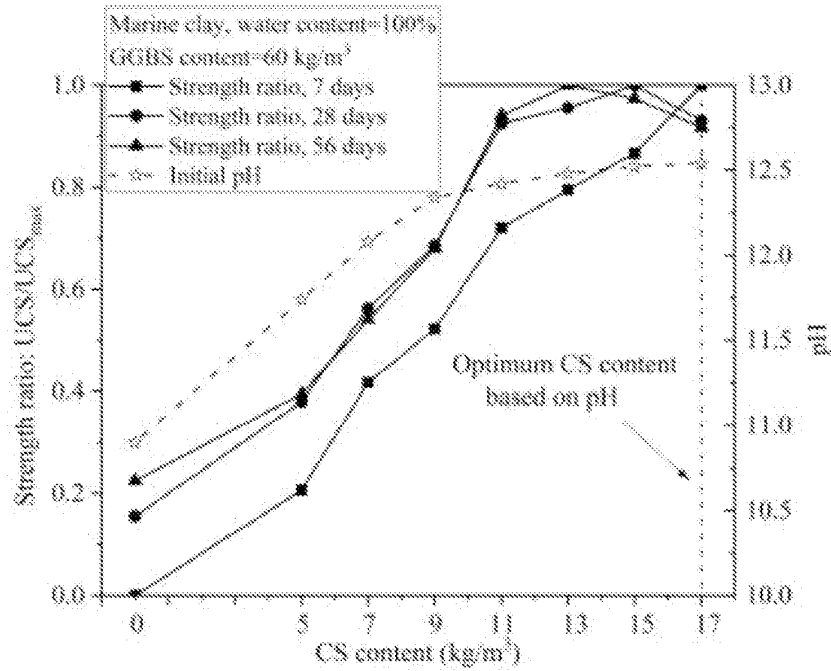


FIG. 5C

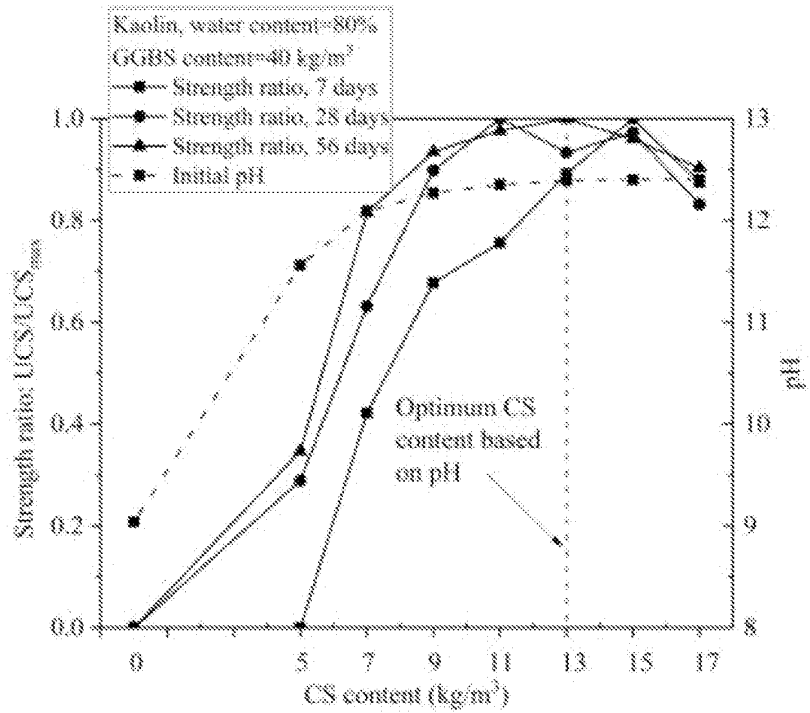


FIG. 5D

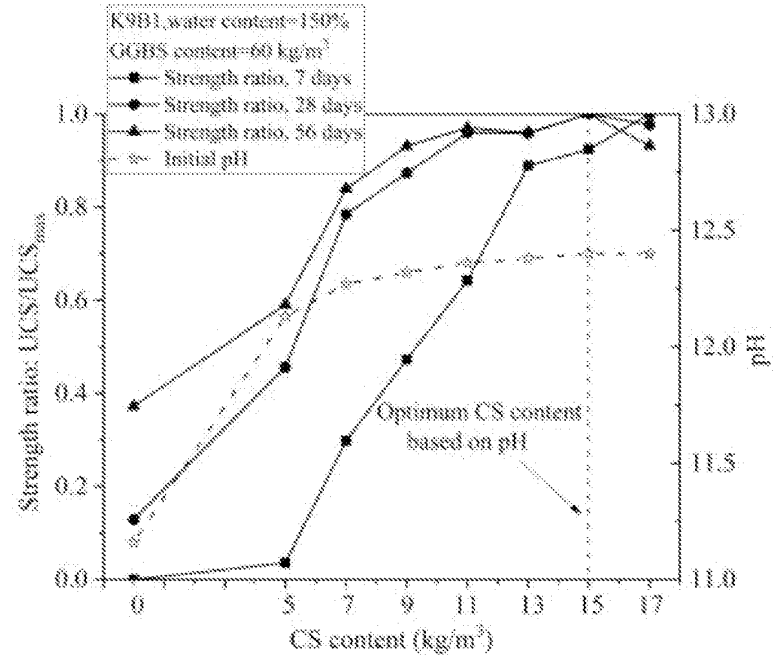


FIG. 6

Clay type	GGBS content (kg/m ³)	Estimated CS content according to initial pH (kg/m ³)	Corresponding UCS ratio	
			28-day	56-day
Marine clay	40	15	1	1
Marine clay	60	17	0.930	0.917
Kaolin	40	13	0.937	1
K9B1	60	15	1	1

FIG. 7

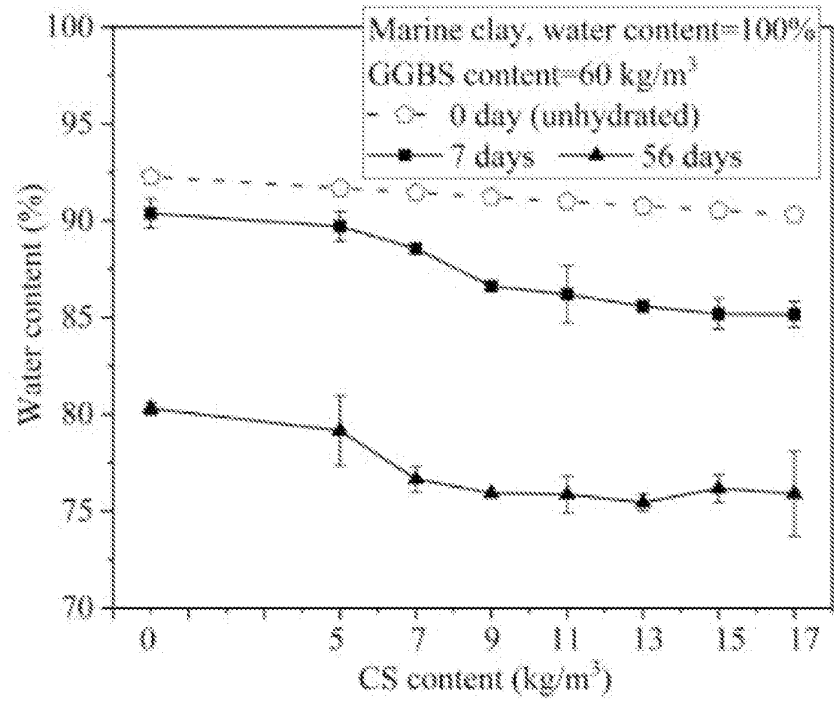


FIG. 8

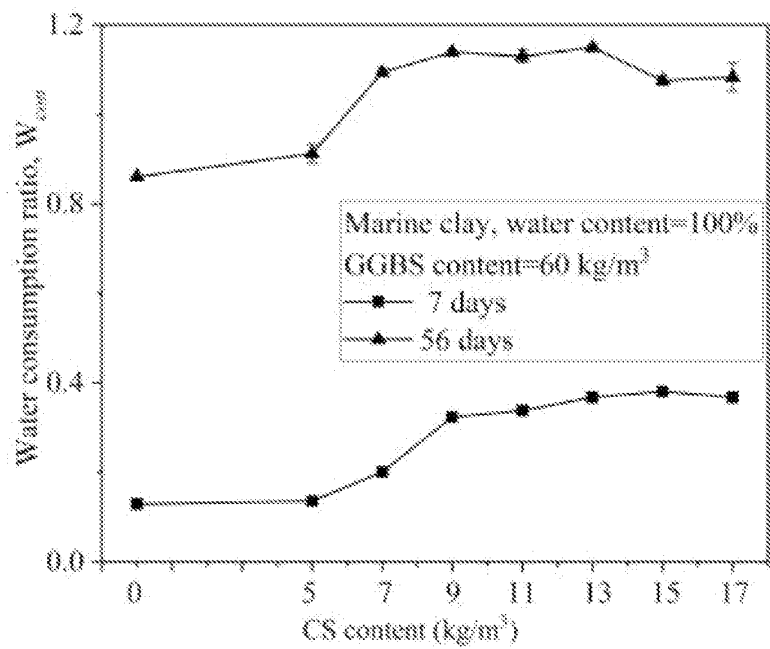


FIG. 10

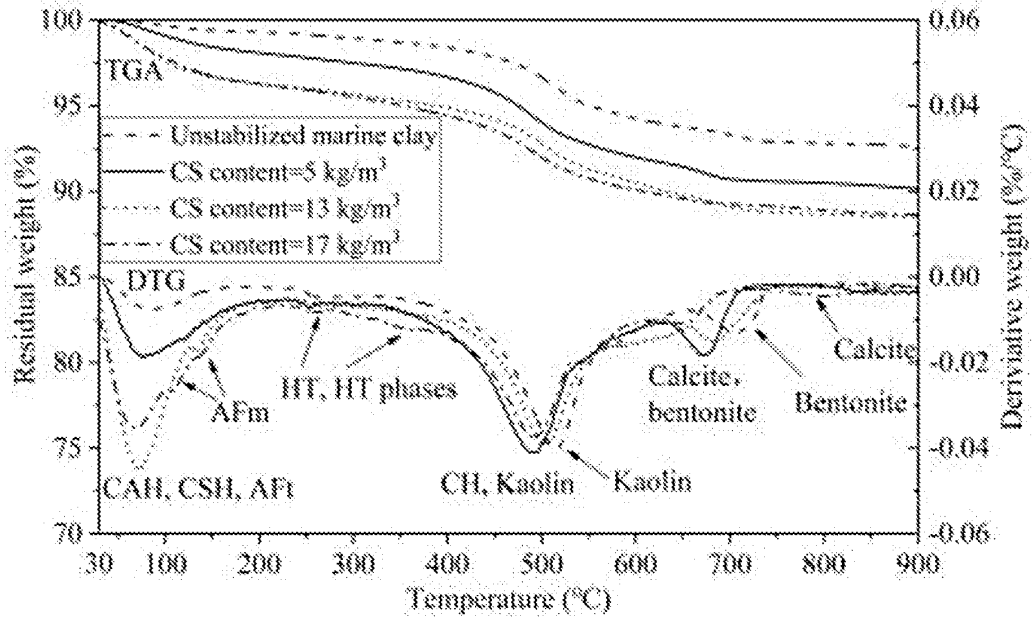


FIG. 11

