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Experimental study on in-situ removal of Cd pollutants from paddy soil by CHIM in northern Guangxi,China

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This study analyzed the comprehensive effects of different power supply duration, voltage gradient,power supply mode and electrolyte type on the remediation efficiency and power loss of Cd-polluted paddy soil in northern Guangxi. In addition, the internal mechanism of CHIM technology in repairing Cd -contaminated paddy soil and the migration and conversion of Cd pollutants were analyzed and discussed.

Tab.1Visual analysis of Cd removal rate in orthogonal experiment

Experimental sequence number	Power duration(h)	Voltage gradient(V/cm)	Power supply mode	Type of electrolyte	Removal rate of Cd(%)
EK1	72	0.3	Continuous	Secondary deionized water	36.47
EK2	72	0.6	Switching electrode	EDTA-2Na	45.54
EK3	72	0.9	Intermittent	Citric acid	38.25
EK4	108	0.3	Switching electrode	Citric acid	35.07
EK5	108	0.6	Intermittent	Secondary deionized water	43.13
EK6	108	0.9	Continuous	EDTA-2Na	49.14
EK7	144	0.3	Intermittent	EDTA-2Na	45.41
EK8	144	0.6	Continuous	Citric acid	44.90
EK9	144	0.9	Switching electrode	Secondary deionized water	43.89
K_{j1}	120.25	116.94	130.51	123.48	
K_{j2}	127.33	133.57	124.49	140.08	
K_{j3}	134.19	131.27	126.78	118.22	
k_{j1}	40.08	38.98	43.50	41.16	
k_{j2}	42.44	44.52	41.50	46.69	
k_{j3}	44.73	43.76	42.26	39.41	
R	4.65	5.54	2.00	7.29	
Ranking of factors by significance	3	2	4	1	
Optimal level	144	0.6	Continuous	EDTA-2Na	

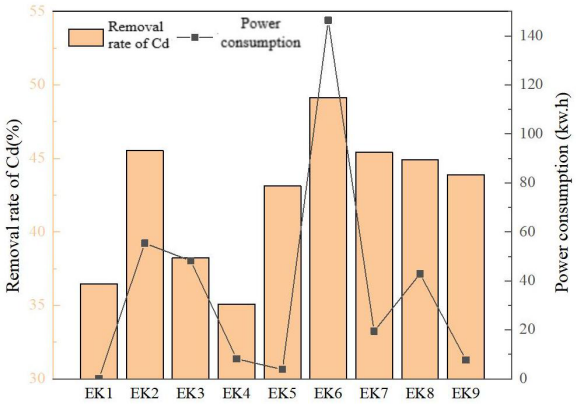

Fig. 1 Relationship between Cd removal rate and energy consumption in nine experiments