ISO 20468-6:2021 (E)

Guidelines for performance evaluation of treatment technologies for water reuse systems — Part 6: Ion exchange and electrodialysis

Contents

	Forev	word
	Intro	duction
1	Scop	е
2	Norm	native references
3	Term	s, definitions, and abbreviated terms
	3.1 3.2	Terms and definitions List of Abbreviated terms
4	Outline of ion exchange and electrodialysis	
	4.1 4.2 4.2.1 4.2.1.1 4.2.1.2 4.2.2 4.2.2.1 4.2.2.2 4.2.2.3 4.3 4.3.1 4.3.1.1 4.3.1.1.2 4.3.1.2 4.3.2 4.3.2 4.3.2.1 4.3.2.2 4.3.2.3 4.3.4 4.4 4.4.1	General Principle of lon exchange[11]-[19] System configuration lon exchange resins lon exchange resin tower Process Process design lon exchange resin selection Operation Principle of Electrodialysis[11]-[19] System configuration lon exchange membrane Classification by ion exchange group Classification by structure Electrodialyser Process Batch method One-pass method Feed & bleed method Multi-stage method Application examples lon exchange
	4.4.1 4.4.2	Electrodialysis
	4.5	Performance evaluation for ion exchange and electrodialysis
5	Perfo	rmance evaluation guideline for ion exchange resin[14]-[19]
	5.1 5.1.1 5.1.1.2 5.1.2 5.1.2.1 5.1.2.2 5.1.2.3 5.1.3 5.2 5.2.1 5.2.1.1 5.2.1.2	Performance evaluation Functional requirements Treated water quality Regeneration efficiency Non-functional requirements Water extractable residue lon exchange resin lifetime Sustainability Timing for evaluating key factors Evaluation method lon exchange resin lon exchange capacity Water extractable residue
	5.2.1.3	Particle size and particle size distribution

	.1.4	Pressure drop of ion exchange resin column
	.1.5	Volume change ratio
	.1.6	Perfect beads content
	.1.7 .1.8	Physical strength Osmotic strength
	.1.0 .1.9	Reaction rate
5.2		Treated water quality
	.2.1	Electrical conductivity
5.2	.3	Ion exchange resin tower
5.2	.3.1	Pressure drop
5.2	.4	Operation and maintenance
6 Performance evaluation guideline for electrodialysis [11]-[18]		rmance evaluation guideline for electrodialysis [11]-[18]
6.1		Performance evaluation
6.1		Functional requirements
	.1.1 .1.2	Product water quality
6.1		Water recovery rate Non-functional requirements
	. <u>2</u> .2.1	Energy consumption
	.2.2	Membrane lifetime
	.2.3	Sustainability
6.1		Timing for evaluating key factors
6.1	.3.1	Indication of initial evaluation
6.1	.3.2	Indication of regular evaluation (maintenance, etc.)
6.1	.3.3	Indication of continuous evaluation (daily or weekly)
6.2		Evaluation method[5],[7],[8],[9]
6.2		Ion exchange membrane
	.1.1	Electrical resistance
	.1.2	Transport number
	.1.3	Permselective coefficient
	.1.4	Mechanical strength
6.2	.2 .2.1	Stack performance Leak current
	.2.1 .2.2	
6.2		Electrical current efficiency Operation and maintenance
Annex A		mative) Main process and typical applications of IER and IEM [20]
Annex B	-	mative) Main treatment technologies and target constituents for reusing water
Annex C	•	mative) Structural model of IER
Annex D	(infor	mative) Selectivity and selectivity coefficient of IERs
Annex E	(infor	mative) Comparison of various IERs
E.1		SAC and WAC
E.2		Comparison of SBA and WBA
Annex F	(infor	mative) General operation of an IER process
Annex G	(infor	mative) Flow diagram of IE and ED process [20]
Annex H	nnex H (informative) Feed water conditions	
Annex I	(infor	mative) Measurement method of electrical resistance of IEM
Annex J	nnex J (informative) Measurement method of transport number of IEM	
Annex K	Annex K (informative) Permselective coefficient of IEM	
Annex L	(infor	mative) Mechanical strength of IEM
Annex M	(infor	mative) Leak current calculation for a stack