

(FNR Process)

()가 () , ()

1.

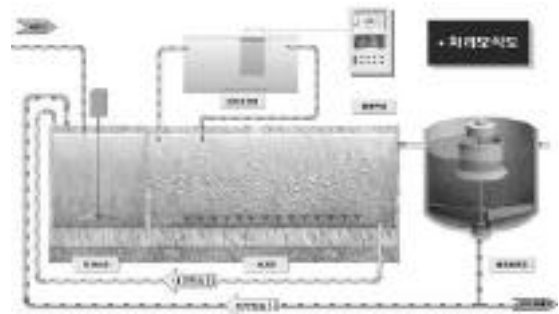
(1)

가

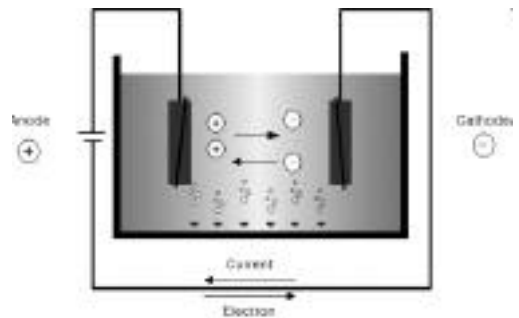
(2)

FNR Process

1

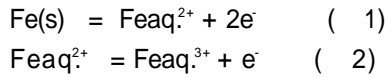


1 FNR Process



2 Schematic diagram of electrolysis

1 2
2가
2가
3가



가

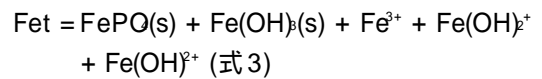
가

pH5

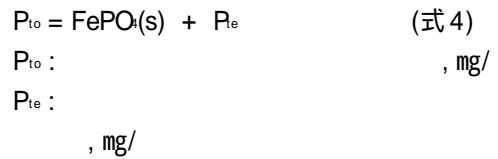
(ligand)
(multinuclear hydrolysis)

가

가 Fe^{3+} , Fe(OH)^{2+} , Fe(OH)^+
 FePO_4 Fe(OH)_3
(Fet)



4



가

, Krauskopf
- Fe_2O_3 , FeOOH , Fe_3O_4 , FeCO_3 , FeS_2 ,
hydrated silicates , < 1 >

pH 10

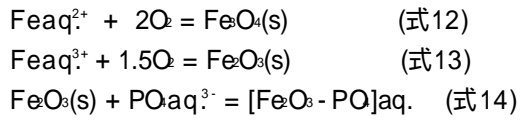
가 10^{-23} mole/

(Stumm, W,
Morgan, J.J, 1978)

2가, 3가

12 13
 Fe_2O_3 Fe_3O_4

14



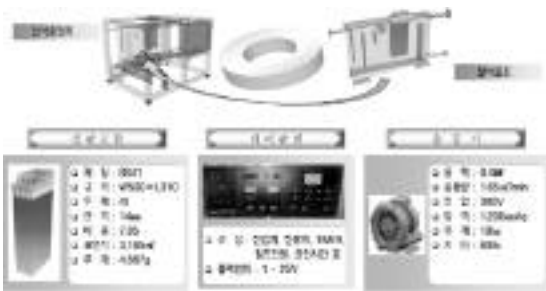
가 5~30
 . FNR Process
 W0.2m×L1.5m×H0.5m
 0.15m³ 20%
 21.6

(3)

< 2 >

< 2 >

diffuser) (air 가),



3



4

			SS 41
			7.85
			500
		mm	310
			4
		g	4,867
		cm ³	620
		cm ²	3,165
		cm ² /g	0.65
		ms/cm	1.03x10 ⁶

2.

(1)

20~50%가

가

A/O

가

(2) 가

가

가 A/O

(scale)
가

가 A2/O

12 (4mm)
50%

FNR

6.0V 20A/Module

C/N 가



5 FISH()

C/N

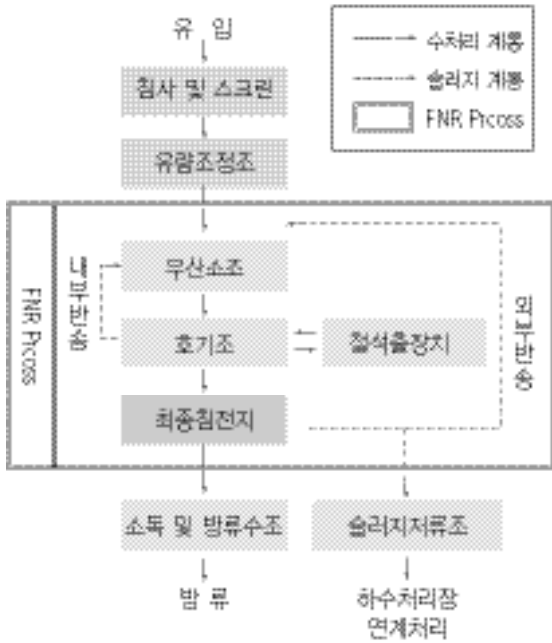
	%Area(NSO190/DAPI)
Nitrosomonas sp.	91.9%
	8.9%
Nitrobactor sp.	92.7%
	7.3%

BOD 7.2mg/ ,
COD 8.4mg/ , SS 5.6mg/ ,
T - N 11.2mg/ , T - P 0.25mg/

< 2 > FISH



3.
(1)



(2)

	- : (Denitrification)
	- : ()
	- : (Nitrification)
	- : ()
	- : , , SS41

4.

(1)

(hr)	: 1.5 ~ 3.0, : 3.0 ~ 5.0
------	--------------------------

F/Mv	0.02 ~ 0.5
SRT (d)	6 ~ 25
μ_m (/d)	0.45 ~ 0.5
Y(net) (mgVSS/mgBODrem)	0.4 ~ 0.8
Y(net) (mgVSS/mgNH4-Nrem)	0.1 ~ 0.3
Kd (VSS)	0.03 ~ 0.06
SNR (mgN/mgMLSS·d)	0.03 ~ 0.05
SDNR (mgN/mgMLSS·d)	:0.72, :0.16, :0.072
(gPO4-Pre/Moduled)	48

(2)

pH	6.5 ~ 7.5	6.5 ~ 7.5	6.5 ~ 7.5
DO (mg/)	0.2	2.0 ~ 4.0	2.0 ~ 4.0
ORP	-300 ~ -100	100 ~ 300	100 ~ 300
MLSS	2,000 ~ 4,000	2,000 ~ 4,000	2,000 ~ 4,000
(%)	-	100 ~ 150	20 ~ 50
(%)	-	30 ~ 60	-
(V), (A)	-	-	1.5 ~ 6.0(20~60)

(3)

	(mg/)	(mg/)	(%)
BOD	82.0(61.1~105.4)	7.2(3.7~10.5)	91.2(86.0~94.7)
CODMn	51.0(40.1~74.7)	8.4(4.2~12.6)	83.5(73.1~91.7)
SS	80.4(29.0~118.0)	5.6(2.0~9.5)	93.1(69.0~97.9)
T-N	33.5(26.1~40.7)	11.2(8.8~14.7)	66.5(55.2~74.1)
T-P	3.6(2.2~4.5)	0.3(0.2~0.3)	92.8(89.5~95.7)

()

.(031-225-3311 www.envinet.co.kr)