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## Refuse Decomposition

## **III. Accelerated Methane Phase**

- gas composition ~ 50%/50%  $CH_4/CO_2$
- steep increase in methane production
- decreasing leachate BOD, COD
- pH ~ 7



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Idpid	3: Leachate analys	115	
	(parameters with	h differences b	etween acetic
	and methanogen:	.c phase)	
	ave	age r	ange
acetic	phase .		
PH	(-) 6	1	4,5 - 7,5
BODs (	mg/l) 1300	10 4	000-40000
COD (	mg/1) 2200	0 6	000-60000
BODs / C	COD (-) 0,	8	-
SO4 (m	ng/1) 50	00	70- 1750
Ca (mg	1/1) 120	00	10- 2500
Mg (mg	1/1) 4	0	50- 1150
Fe (mg	71) 71	30	20- 2100
Mn (mg	1/1)	25	0,3- 65
Zn (mg	1/1)	5	0.1- 120
methan	logenic phase		1. The second
pH	(-)	8	7.5- 9
BODs (	mg/1) 13	30	20- 550
COD (m	ng/1) 300	00	500- 4500
BODs /C	COD (-) 0.0	06	-
SO4 (m	ng/1)	30	10- 420
Ca (mg	1/1)	50	20- 600
Mg (mg	1/1) 1	30	40- 350
Fe (mg	1/1)	5	3- 280
Mn (mg	1/1) 0	.7 0	.03- 45
Zn (mg	(1) 0	.6 0	.03- 4

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Table 4: Leachate (no diffe observed	analysis erences between )	phases could be
	average	range
Cl (mg/l)	2100	100- 5000
Na (mg/l)	1350	50- 4000
K (mg/l)	1100	10- 2500
alkalinity		
(mg CaCO <sub>3</sub> /1)	6700	300-11500
NH4 (mg N/1)	750	30- 3000
orgN (mg n/l)	600	10- 4250
total N (mgN/l)	1250	50- 5000
NO3 (mg N/l)	3	0,1- 50
NO <sub>2</sub> (mg N/l)	0,5	0- 25
total P (mg P/1)	6	0,1- 30
AOX (µg Cl/l)*	2000	320- 3500
As (ug/l)	160	5- 1600
Cd $(\mu g/1)$	6	0,5- 140
Co (µg/1)	55	4- 950
Ni $(\mu g/l)$	200	20- 2050
Pb $(\mu g/1)$	90	8- 1020
$Cr(\mu g/1)$	300	30- 1600
Cu (µg/1)	80	4- 1400
Hg $(\mu g/1)$	10	0,2- 50



Rate of C	H <sub>4</sub> Produc	tion	
2. Can assume half-lives of kinetic expression for r example, dividing organ assuming half-lives for	of specific com ate of decompo nics in refuse a first order equ	ponents and a osition.* For s follows, and ation:	
	Min. half life	Max. half life	
rapidly decomposable (food, garden wastes)	1/2 yr.	1-1/2 yrs.	
moderately decomposable (paper, wood)	5 yrs.	25 yrs.	
refractory (plastics, rubber)	infinite	infinite	
First-order kinetic expression:			
$-\frac{dc}{dt} = kc$ where c	$\frac{dc}{dt}$ = kc where c = amount decomposable matter dt left at time t		
k	= constant and is a	function of half-life	
=	0.69		



















