

COD Fractionation

A. Saatci

PROSEDÜR

1. Süzülmüş ve süzülmemiş KOİ ölçülür.

KOİ =	437	mg/L
Süz. KOİ =	119	mg/L

2. Çıkış KOİ süzülerek ölçülür.

S_i =	35.5	mg/L
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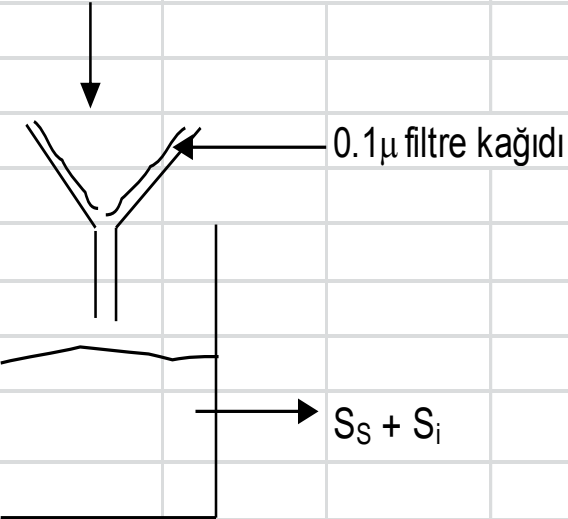
3. Nihai BOİ Thomas Metodu ile hesaplanır.

t	y	$(t/y)^{1/3}$
1	100	0.2154
2	180	0.2231
3	200	0.2466
4	230	0.2591
5	250	0.2714

Eğim =	0.014794
Kesim Nokt=	0.198766
R2=	0.989712

k=	0.194161
Nihai BOİ=	332.16

$$KOİ = S_s + S_i + X_s + X_i$$



$$bKOİ = S_s + X_s$$

BOD_u and BOD₅

If BOD is measured daily, use Thomas method to find k and BOD_u:

$$\left(\frac{t}{\text{BOD}_t}\right)^{1/3} = (k\text{BOD}_u)^{1/3} + \left[\frac{k^{2/3}}{5.98(\text{BOD}_u)^{1/3}}\right]t$$

- Equation has form $y = a + b x$, so if plotted, should become a straight line where:

$$k = 5.98 (b/a), \text{ and } \text{BOD}_u = 1/(ka^3)$$

t	y(BOİ_t)	(t/y)^(1/3)
1	100	0.2154
2	170	0.2274
3	230	0.2354
4	250	0.2520
5	270	0.2646
15	1,020	1.1948
n	5	
b=Eğim	0.01228	
a=Kesişme	0.20213	
R ²	0.99473	
k	0.3633302825	=5.98*b/a
Nihai BOİ	333.3027502	=1/(k*a ³)

4. *bKOİ hesaplanır.*

$$bKOİ = \text{Nihai BOİ} / (1-fBOİ)$$

$$fBOİ = 0.15$$

$$bKOİ = 390.77 \text{ mg/L} \quad \text{veya } bCOD = 1.6 * BOD_0 \text{ denkkemi kullanılır.}$$

5. *Ss hesaplanır.*

$$Ss = \text{Giriş Süzülmüş KOİ} - \text{Çıkış Süzülmüş KOİ}$$

$$Ss = 83.5 \text{ mg/L}$$

6. *Xs hesaplanır.*

$$Xs = bKOİ - Ss$$

$$Xs = 307.27 \text{ mg/L}$$

7. *Xi hesaplanır.*

$$Xi = \text{Giriş KOİ} - Ss - Si - Xs$$

$$Xi = 10.73 \text{ mg/L}$$

PAŞAKÖY AAT ATIKSU KARAKTERİZASYONU

Giriş			
Top.KOİ	437	mg/L	$S_S + S_i + X_S + X_i$
Süz.KOİ(sKOİ)	119	mg/L	$S_S + S_i$
Çıkış			
Top.KOİ		mg/L	
Süz.KOİ	35.5	mg/L	S_i
Hesap			
Nihai BOİ	332.2	mg/L	
fBOİ	0.15	mg/L	
bKOİ(ayrışabilir)	390.8	mg/L	$S_S + X_S = (\text{Nihai BOİ} / (1-f\text{BOİ})) = 1.6 \cdot \text{BOD}_0 = 432$
S_S	83.5	mg/L	$s\text{KOİ} - S_i = S_S = S_A + S_F$
X_S	307.3	mg/L	$b\text{KOİ} - S_S$
X_i	10.7	mg/L	$\text{top.KOİ} - S_S - S_i - X_S$
Not: S_A (VFA/SCFA) değeri de İTÜ'de yapılan GC ölçümlerine göre (ortalama olarak);			
S_A	36	mg/L	
S_F	47.5	mg/L	

Influent Characteristics		
Heterotrophic Organisms	XbH_in	0.001
Autotrophic Organisms	XbA_in	0.001
Particulate Products	Xp_in	0.001
Inert Particulates	Xi_in	10.730
Particulate Organics	Xs_in	307.3
Soluble Organics	Ss_in	83.5
Soluble Ammonia N	<i>Snh_in</i>	25.0
Soluble Nitrate/Nitrite N	<i>Sno_in</i>	0.0
Soluble Organic N	<i>Snd_in</i>	2.0
Biodeg. Particulate Organic N	<i>Xnd_in</i>	6.2
Diss. Oxygen	So_in	0.0
Alkalinity	Salk_in	5.1
Soluble inert organic matter	Si	35.5