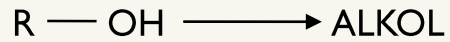
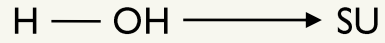
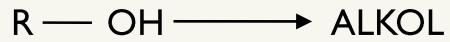


dersdeo
öğrenmenin en kolay yolu ol!

KİMYA

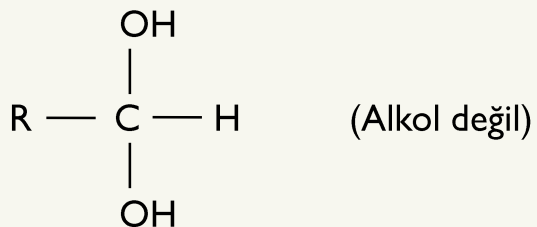
ALKOLLER VE ETERLER

Alkoller



Hangi durumlarda alkol olmaz?

- Aynı C atomuna iki — OH grubunun bağlı olduğu bileşikler alkol değildir. Çünkü böyle bir bileşik kararsız olup kolaylıkla su kaybeder, aldehit ya da ketona dönüşür.

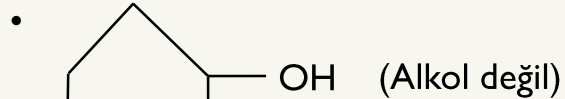


- $\text{CH}_2 = \text{CH} - \text{OH}$ (Alkol değil)

(Vinil Alkol)

(Vinil alkol bir enoldür ve kararsızdır.)

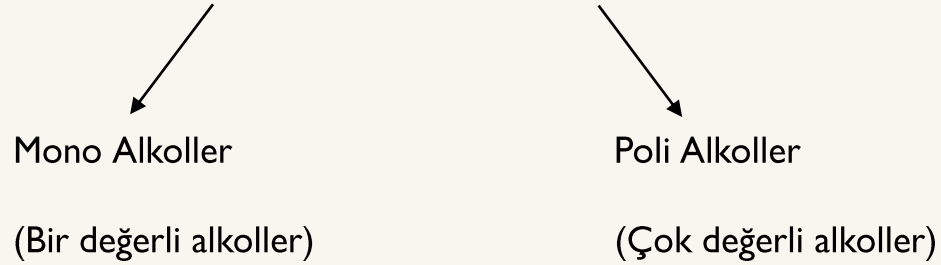
NOT: $-\text{OH}$ grubu doymuş karbon atomuna bağlı olmalıdır.



(Fenol)

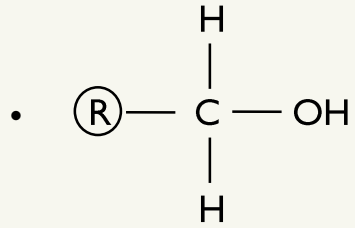
(Zayıf Asit)

Alkollerin Sınıflandırılması



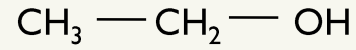
Mono Alkoller (Bir Değerli Alkoller)

- Genel formülleri $R - OH$
↓
 $C_n H_{2n+1} OH$ veya $C_n H_{2n+2} O$ dur.



Primer Alkol

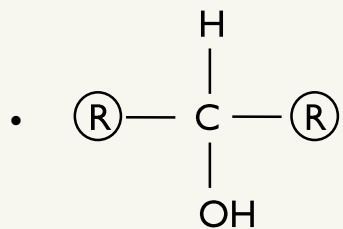
↓
 $n \geq 1$



Etanol

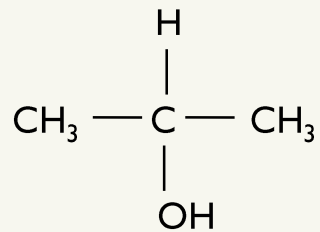
Etil Alkol

Primer Etanol

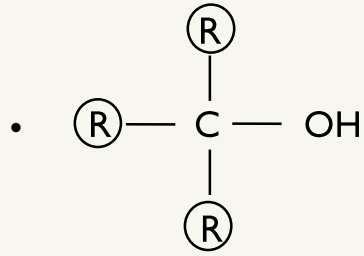


Sekonder Alkol

↓
 $n \geq 3$

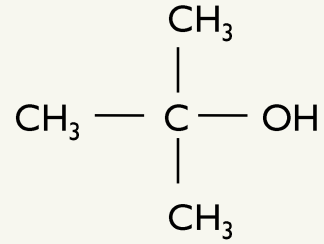


2 Propanol
 sec – propil alkol



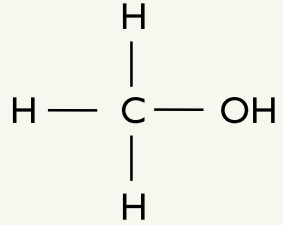
Tersiyer Alkol

↓
 $n \geq 4$



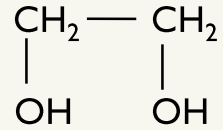
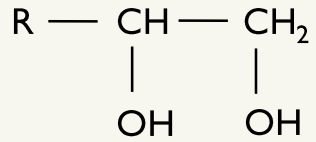
2 metil 2 propanol
ter – bütıl alkol

NOT: Metil alkol, primer alkoldür.



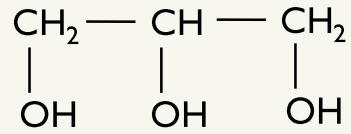
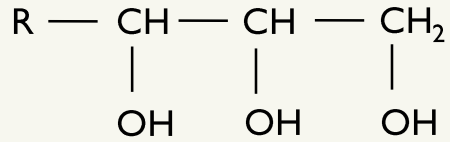
Primer metanol

Di Alkoller $\longrightarrow$ $C_nH_{2n}(OH)_2$ veya $C_nH_{2n+2}O_2$ kapalı formülüne sahiptirler.



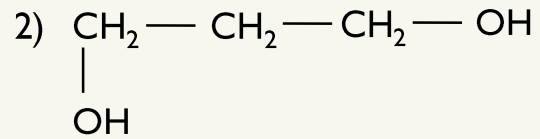
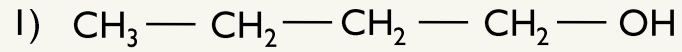
1, 2 Etandiol
Glikol

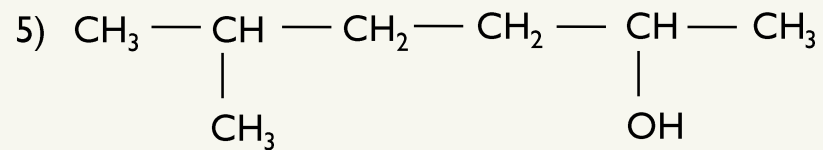
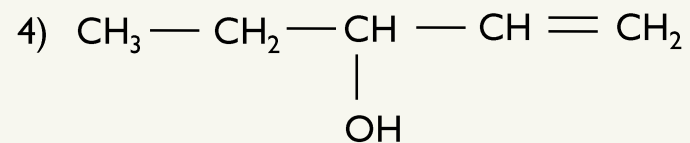
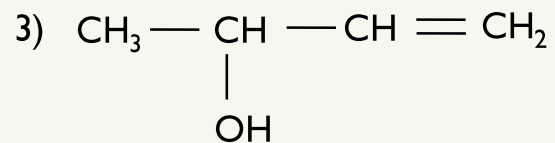
Tri Alkoller $\longrightarrow$ $C_nH_{2n-1}(OH)_3$ veya $C_nH_{2n+2}O_3$ kapalı formülüne sahiptirler.



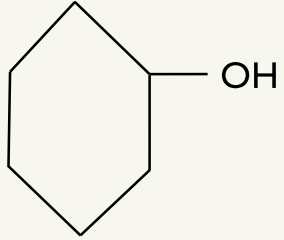
1, 2, 3 propantriol
Gliserin

Alkollerin Adlandırması

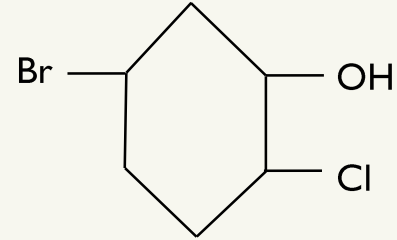


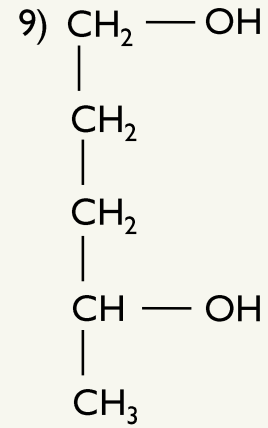
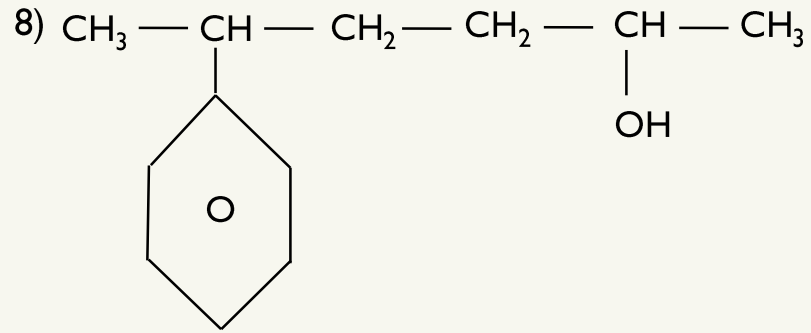


6)

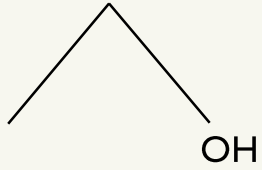


7)

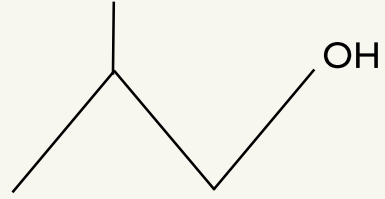




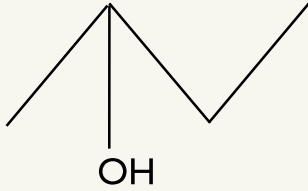
10)



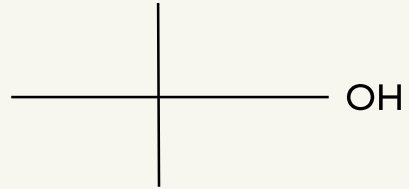
11)



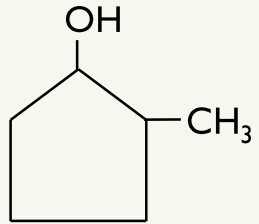
12)



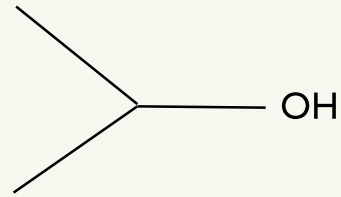
13)

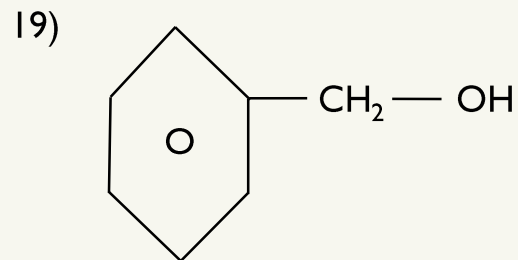
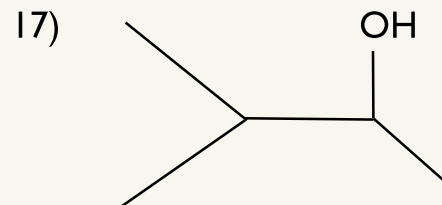
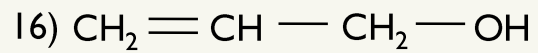


14)



15)





ÖRNEK

2 metil 1 bütanolün iskelet formülü nedir?

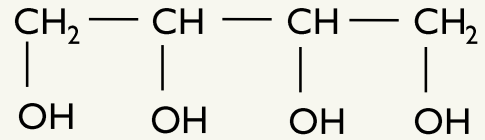
- İzobütanol $\longrightarrow$

- Tersiyer bütanol $\longrightarrow$

- Sec. bütil alkol →

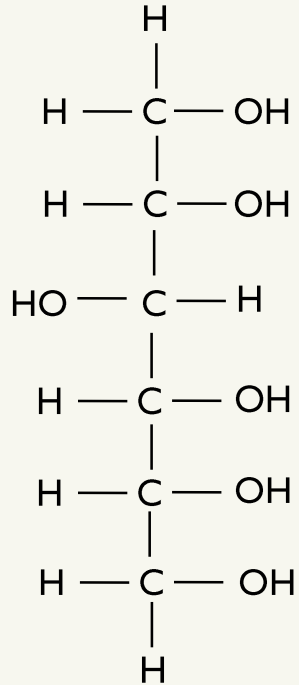
- Neo pentil alkol →

- Eritritol (Bütan 1, 2, 3, 4 tetraol)



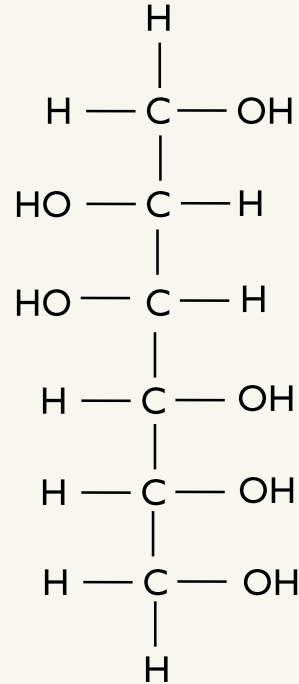
Tatlandırıcılarda ve gıda sanayisinde kullanılır.

- Sorbitol



Şeker hastaları için şekere alternatiftir ve böğürtlende bulunur.

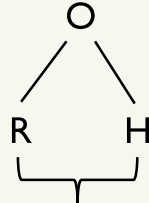
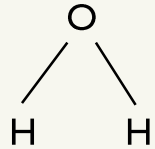
- Mannitol



(Zeytinde D – mannitol bulunur.)
Eczacılıkta, besin maddelerinde ve tatlandırıcı olarak kullanılır.

Alkollerin Genel Özellikleri

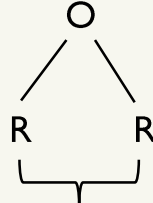
- Alkoller suda iyonlaşmadıklarından elektrolit değildirler.
- Alkoller baz özelliği göstermezler. Nötr maddelerdir.
- Aynı karbon sayılı eterler ile mono alkoller izomerdirler. Metanolün izomeri olan eter yoktur.



Alkol



$$n \geq 1$$



Eter



$$n \geq 2$$

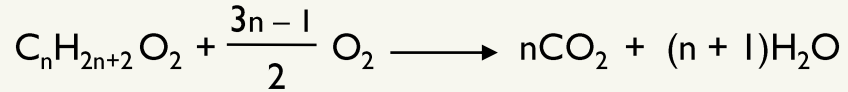
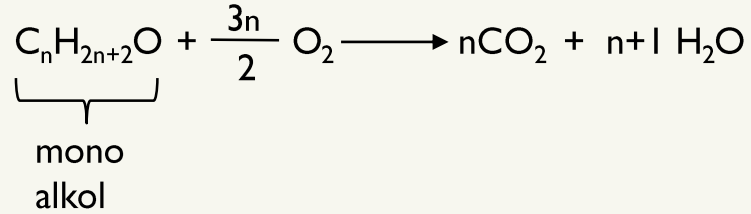
- Homolog sıra oluştururlar.
- Alkoller su gibi açılı ve polar bileşiklerdir.
- 10 karbonluya kadar sıvı, 10'dan fazla karbon taşıyan alkoller katı halde bulunurlar.
- Molekül Ağırlıkları $\uparrow$ $\text{KN} \uparrow$
İzomer alkollerde dallanma $\uparrow$ $\text{KN} \downarrow$

primer alkol $>$ sec alkol $>$ tersiyer alkol

- Hidrojen bağ sayısı ↑ KN ↑
- Aynı sayıda C atomu taşıyan hidrokarbonlar ve eterlere göre KN yüksektir.
- Suda çözünürler. Molekül kütlesi arttıkça alkollerin sudaki çözünürlükleri azalır.

Alkollerin Reaksiyonları

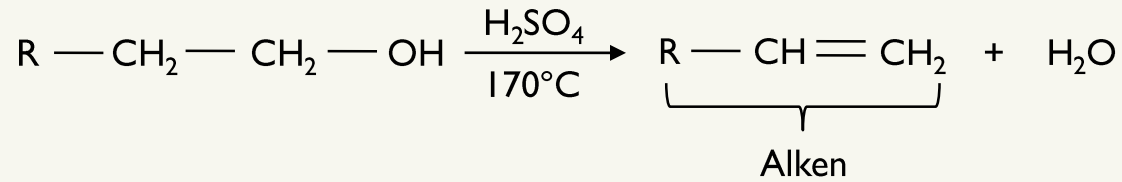
I) Yanma reaksiyonu verirler.



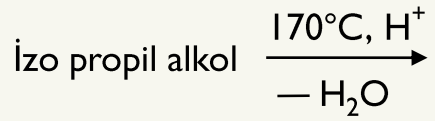
(Yanma tepkimeleri redokstur.)

2) Alkollerin Dehidrasyonu (Su Ayrılması)

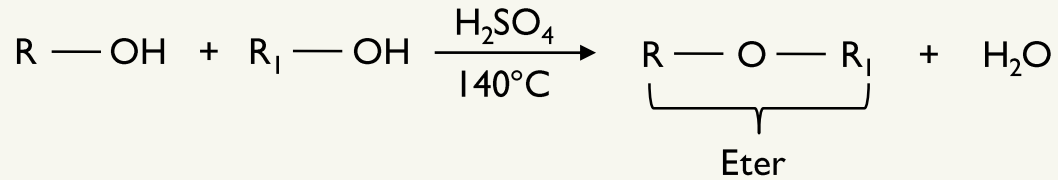
- Molekül içi su ayrılması



ÖRNEK



- Moleküller arası su ayrılması



(Kondenzasyon Tepkimesi)

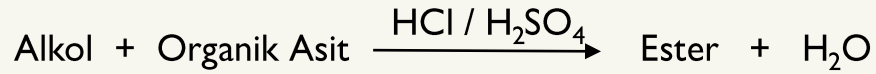
ÖRNEK

Etil alkol kullanarak eter elde ediniz.

ÖRNEK

Metil alkol ve propil alkol kullanarak eter elde ediniz.

3) Esterleşme reaksiyonu verirler.



(Kondenzasyon tepkimesi)

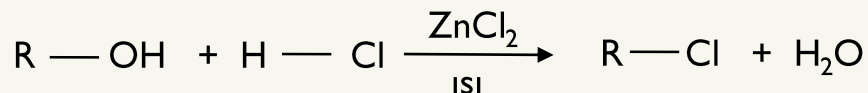
ÖRNEK

Etil alkol ve asetik asit tepkimesinden hangi ürünler oluşur?

4) Yer Değiştirme (Süstitüsyon) Reaksiyonu

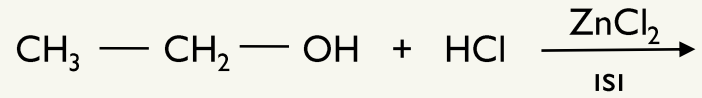
a) OH Grubunun Yer Değiştirmesi

Asidik çözeltilerde alkoller halojen asitleriyle yer değiştirme tepkimesi verirler. Bir alifatik alkol olan **Lucas ayıracı** (ZnCl_2 nin derişik HCl deki çözeltisi) ile muamele edilirse alkil halojenür oluşur.



* Reaksiyon, nükleofilik yer değiştirme (süstitüsyon) reaksiyonudur.

ÖRNEK

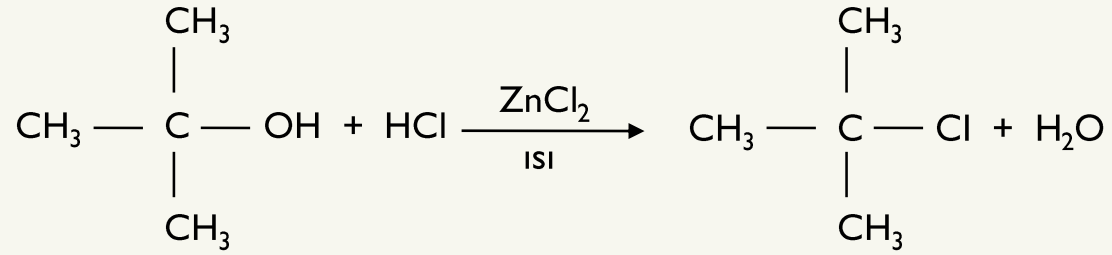


NOT:

Aynı koşullarda tersiyer alkoller kısa bir sürede (5 dakika), primer alkoller 1,5 saat gibi uzun bir sürede, sekonder alkoller ise primer alkollerden daha kısa bir sürede gerçekleşir.

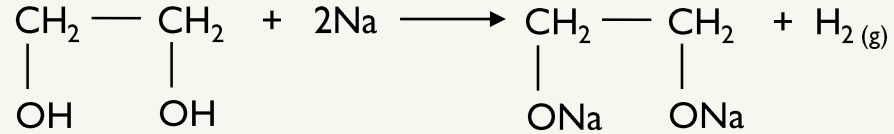
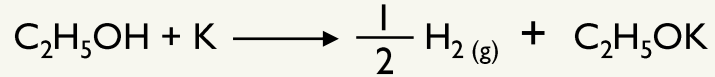
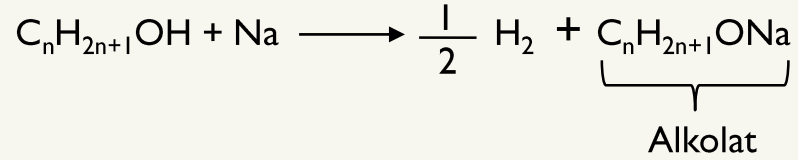
- Nükleofilik süstitüsyon mekanizmasına göre gerçekleşen tepkimenin hızlarının karşılaştırılması;

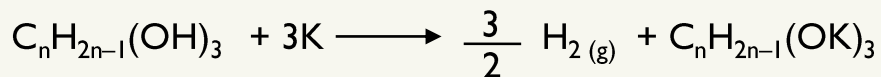
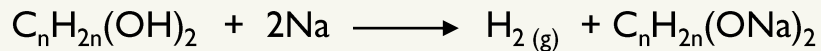
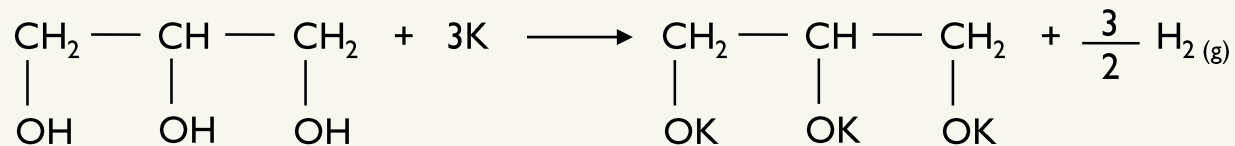
Tersiyer alkoller > sekonder alkoller > primer alkoller



b) OH'deki H'nin Yer Değiřtirmesi

Alkoller, Na, K gibi aktif metallerle reaksiyona girerek alkolat ve $H_2(g)$ oluřtururlar. Alkoller molekül başına, yapısındaki — OH sayısının yarısı kadar $H_2(g)$ açığa çıkarırlar. Dolayısıyla bu bir **redoks** tepkimesidir.

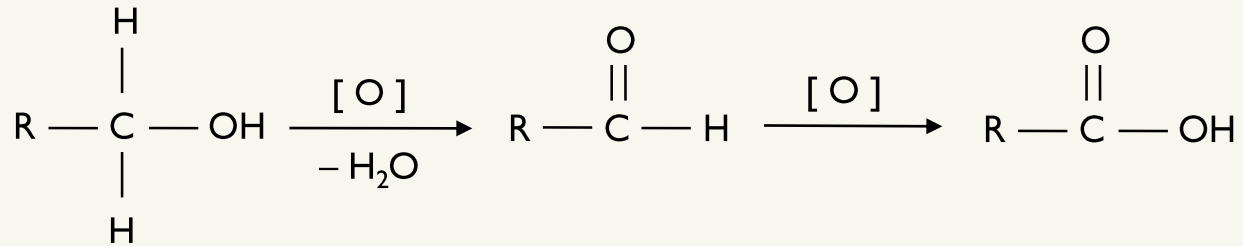
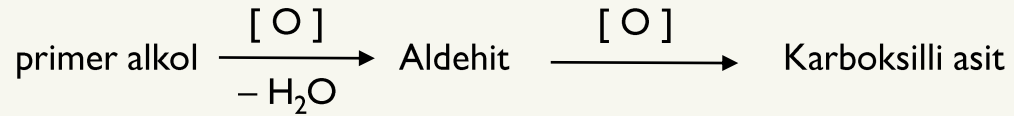




Bu reaksiyonlar alkoldeki O — H bağının koptuğu reaksiyonlardır.

5) Yükseltgenme Reaksiyonları

a) Primer Alkollerin Yükseltgenme Reaksiyonları



ÖRNEK

Primer propanolün yükseltgenme ürünleri nelerdir?

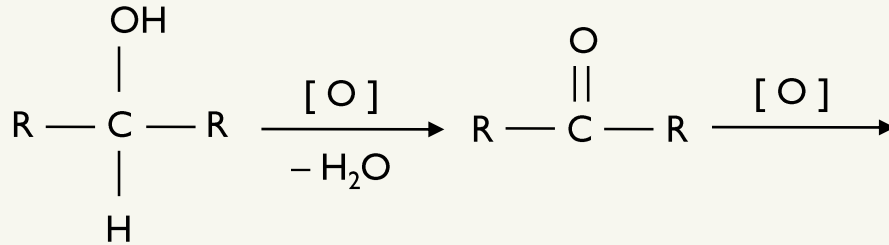
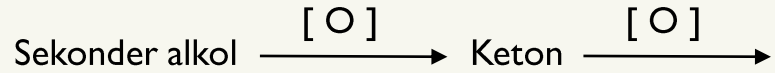
ÖRNEK

Metil alkolün yükseltgenme ürünleri nelerdir?

ÖRNEK

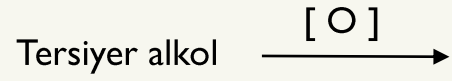
Benzil alkolün yükseltgenme ürünleri nelerdir?

b) Sekonder Alkollerin Yükseltgenme Reaksiyonu

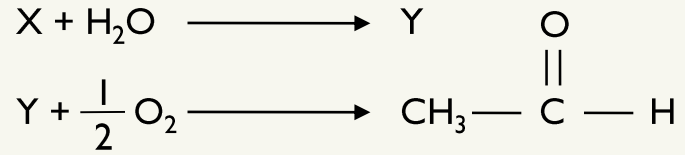


ÖRNEK

Sekonder propanolün yükseltgenme ürünü nedir?

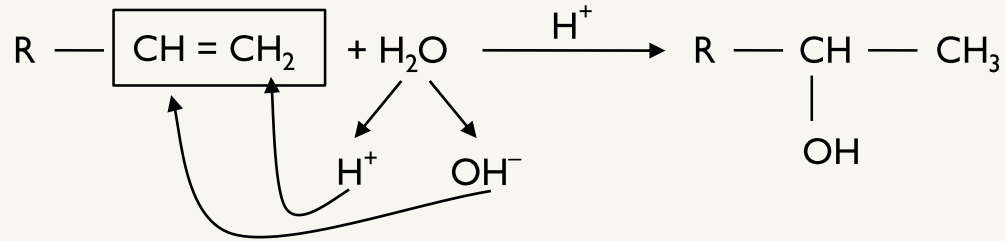
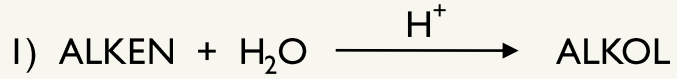


ÖRNEK



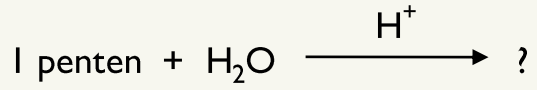
X ve Y maddeleri nelerdir?

Alkollerin Eldesi



(Elektrofilik katılma)

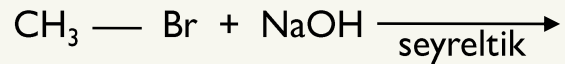
ÖRNEK



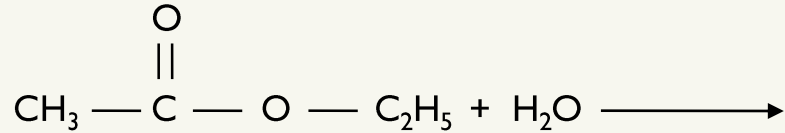
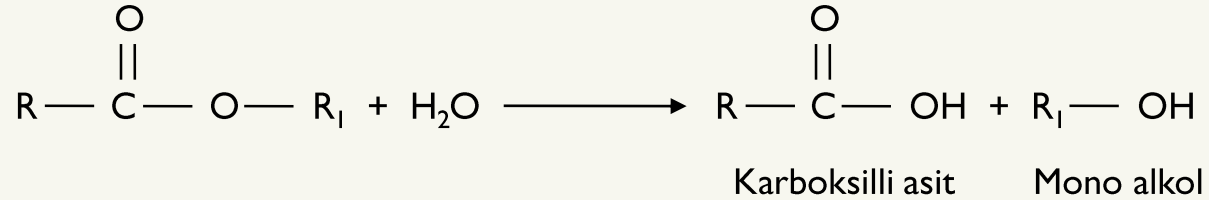
2) Alkil halojenürlerin seyreltik KOH veya NaOH çözeltileriyle ısıtılmasından alkoller elde edilir.



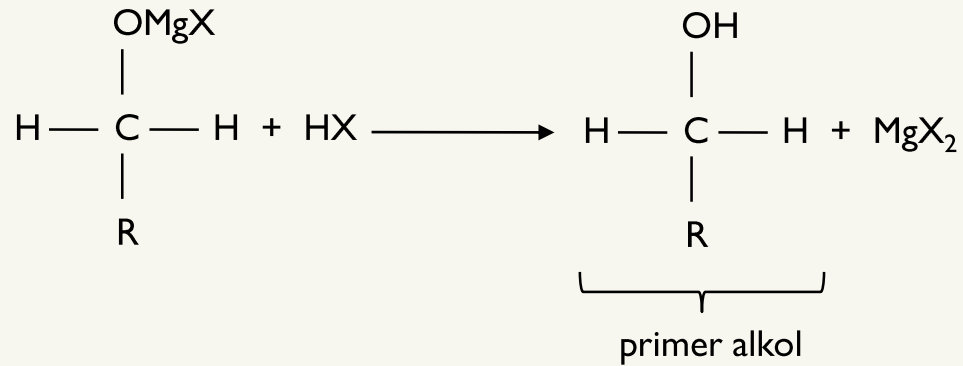
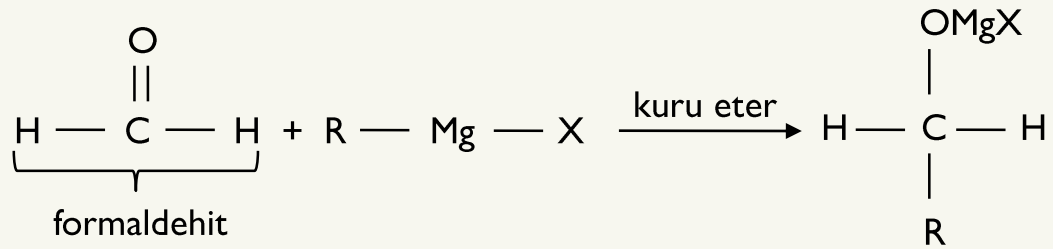
(Nükleofilik yer değiştirme)

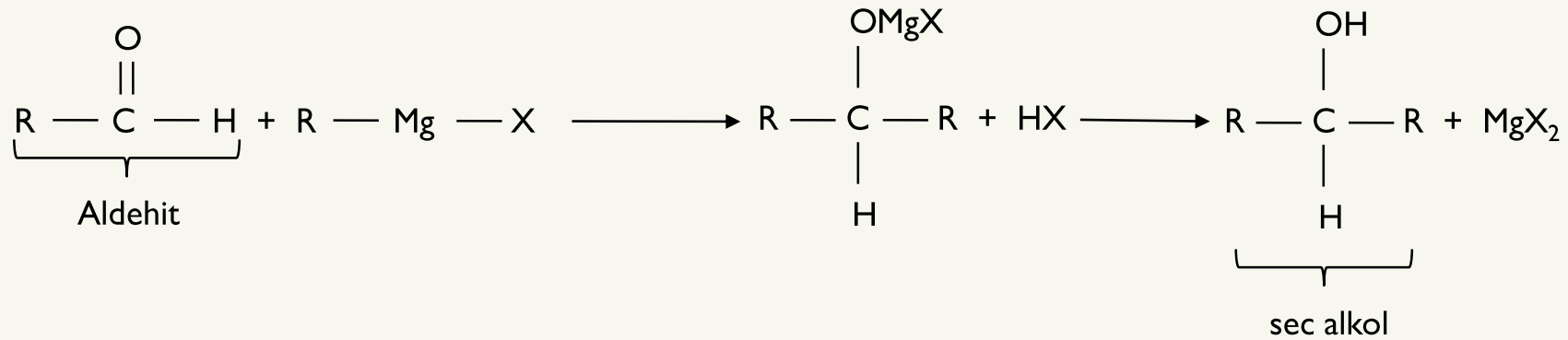


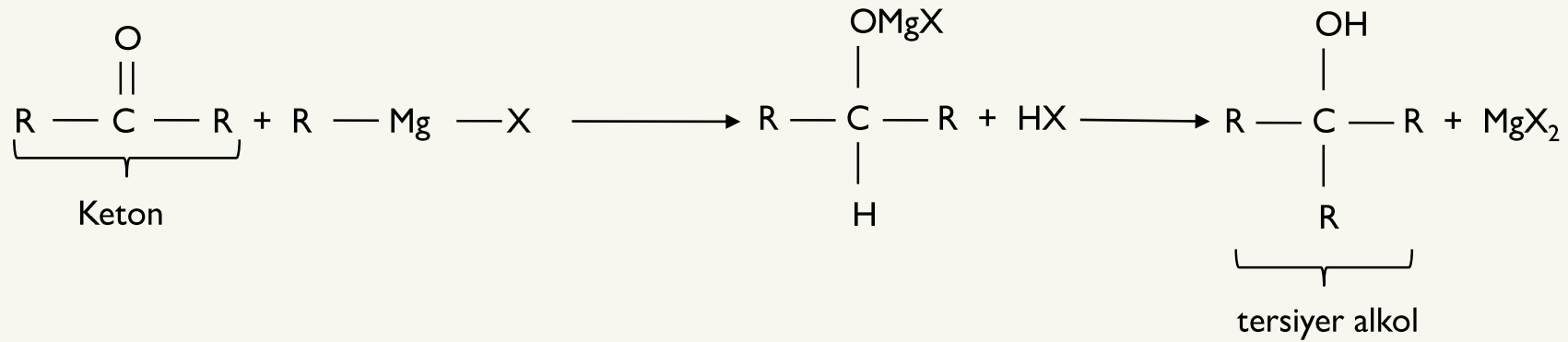
3) Esterlerin su ile hidrolizinden mono alkollerle karboksilli asitler meydana gelir.



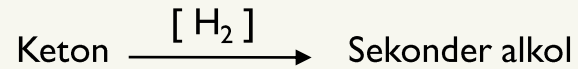
4) Grignard bileşiklerinin karbonil bileşikleriyle (aldehit ve ketonlarla) tepkimesinden primer, sekonder ve tersiyer alkoller meydana gelir.







5) İndirgenme tepkimeleri ile;



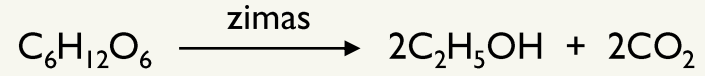
ÖRNEK

Asetik asidin indirgenme ürünleri nelerdir?

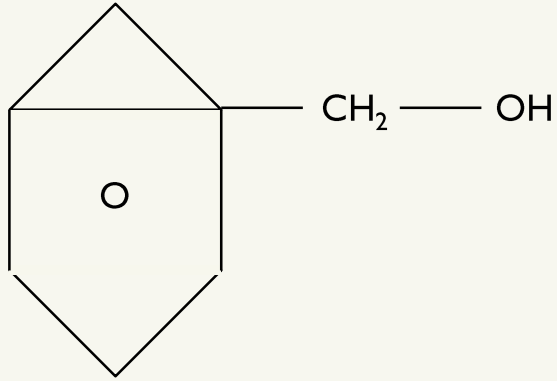
ÖRNEK

Asetonun indirgenme ürünü nedir?

Etil Alkol Eldesi

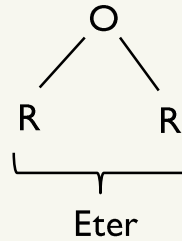
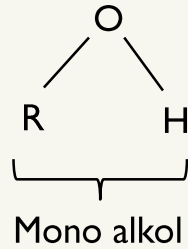
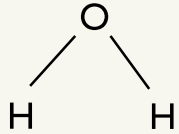


Benzil Alkol

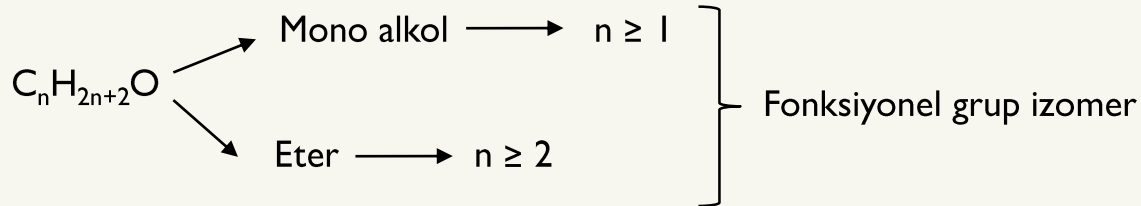


(Alkollerin özelliklerini gösterir.)
(1A 'yı severler.)

Eterler

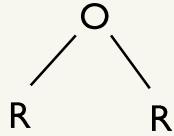


Genel formülleri $C_nH_{2n+2}O$ 'dur.

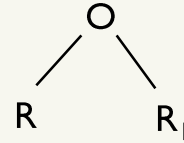


Eterlerin Sınıflandırılması

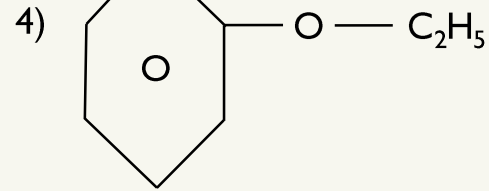
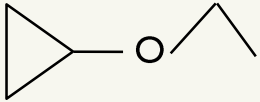
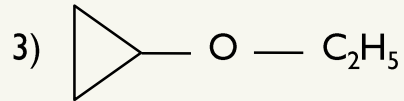
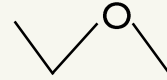
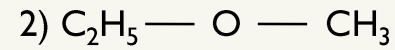
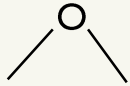
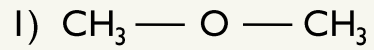
Basit eter
(Simetrik eter)

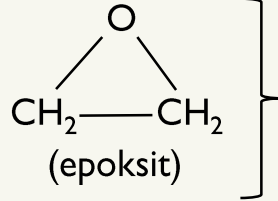
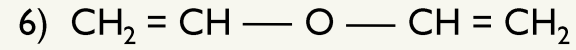
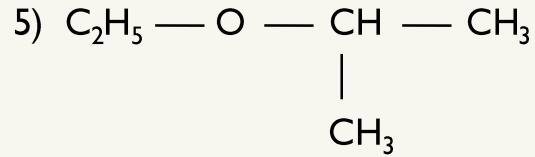


Karışık eter
(Asimetrik eter)

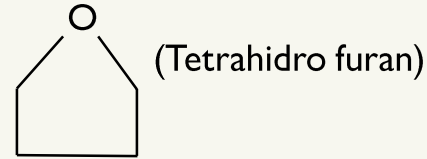


Eterlerin Adlandırılması





Üç üyeli halkalı
eterlere **epoksit**
denir.



Okso siklo pentan
(THF)

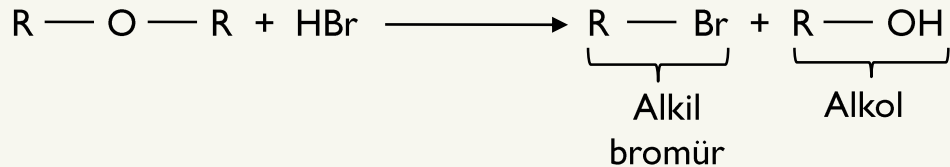
Eterlerin Genel Özellikleri

a) Fiziksel Özellikleri

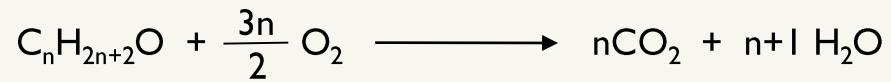
- 1) Molekülleri arası hidrojen bağı yoktur. Aynı karbon sayılı alkollere göre K_N düşüktür.
- 2) Homolog sıra oluştururlar.
- 3) Polar moleküllerdir. Polar moleküller için çözücü olarak kullanılırlar.

Kimyasal Özellikleri

- 1) Eterlerin C — O bağı kolay kopmadığından, alkollere göre kimyasal tepkimelere karşı ilgileri daha azdır.
- 2) IA grubu metalleri ile tepkime vermezler.
- 3) Derişik HI, HBr ve HCl asitleri ile tepkime verirler.

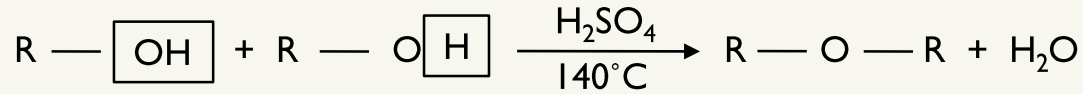


4) Yanarlar.

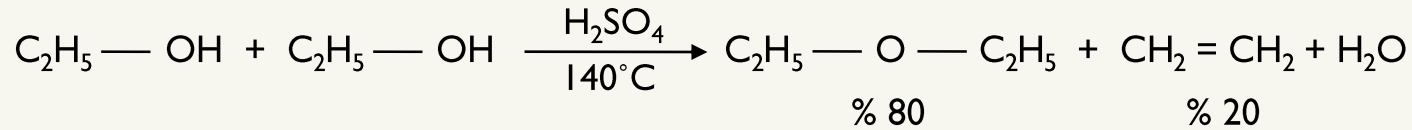


Eterlerin Elde Edilme Yolları

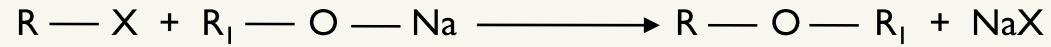
1) Alkollerin dehidrasyonu ile;



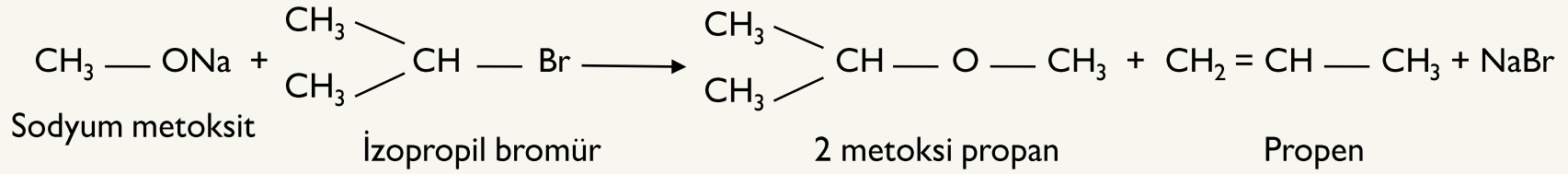
(Kondenzasyon tepkimesi)



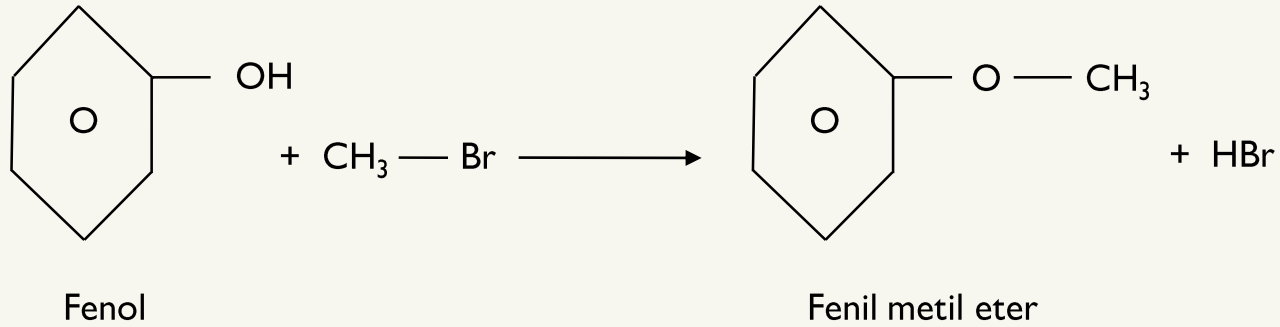
2) Williamson Sentezi ile;



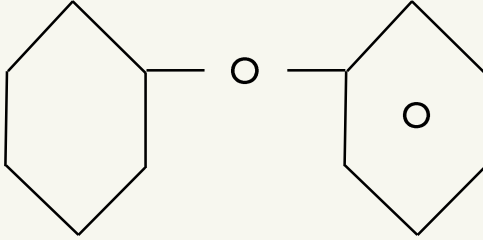
(Nükleofilik süstitüsyon reaksiyonu)



NOT: Eter yüzdesinin fazla olması için alkil halojenür dallanmış olmamalıdır.



ÖRNEK



- I) Basit eterdir.
- II) Adı fenil sikloheksil eterdir.
- III) K ile tepkime verir.

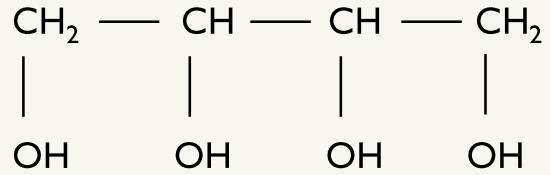
yargılarından hangileri doğrudur?

ÖRNEK

14,8 gram mono alkolün yeterli miktarda K metali ile tepkimesi sonucu 0,1 mol H_2 (g) açığa çıkmaktadır. Buna göre bu alkolün izomeri olan simetrik eter nedir?

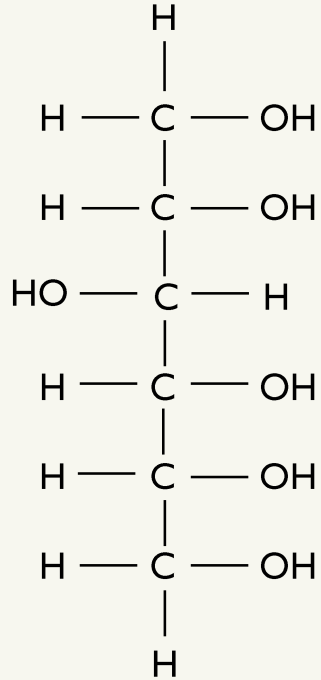
(H = 1 C = 12 O = 16)

- Eritritol (Bütan 1, 2, 3, 4 tetraol)



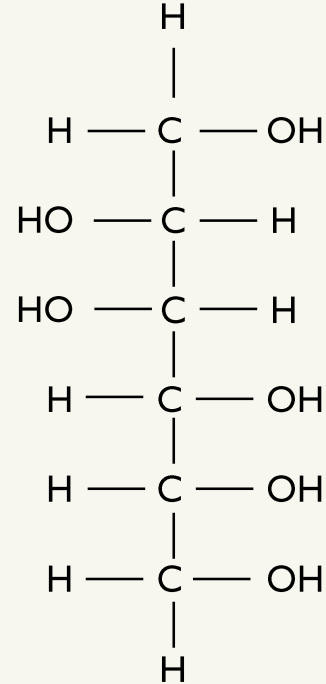
Tatlandırıcılarda ve gıda sanayisinde kullanılır.

- Sorbitol



Şeker hastaları için şekere alternatiftir ve böğürtlende bulunur.

- Mannitol



(Zeytinde D – mannitol bulunur.)
Eczacılıkta, besin maddelerinde ve tatlandırıcı olarak kullanılır.