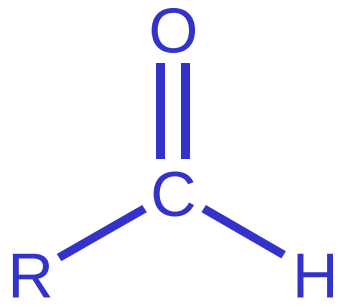
DOGHK\GHV#ĐQG#NHWRQHV#

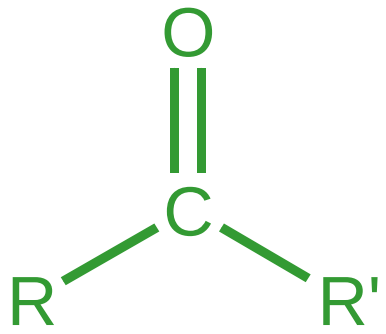
VWUXFWXUH

Aldehyde



R = H, alkyl, aryl

Ketone



R and R' = alkyl or aryl
R and R' cannot be hydrogen!

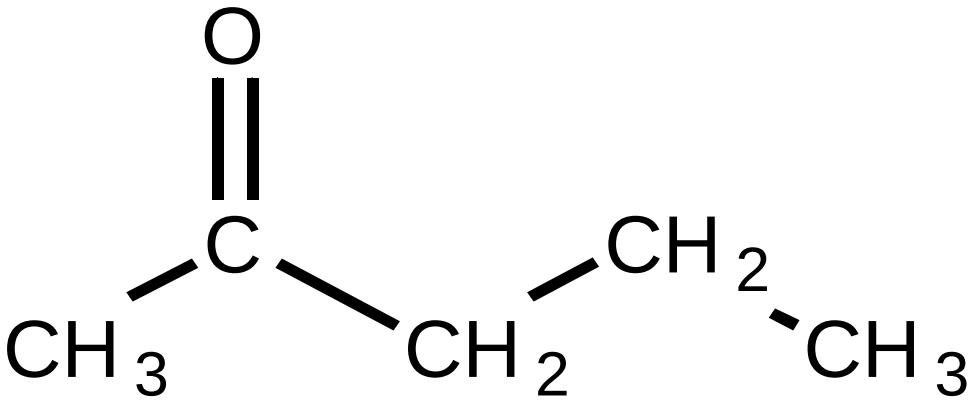
Q R P H Q F OD WX U H

IX SDF#Q rp hqfodwxuh#ri#Nhwrqhv

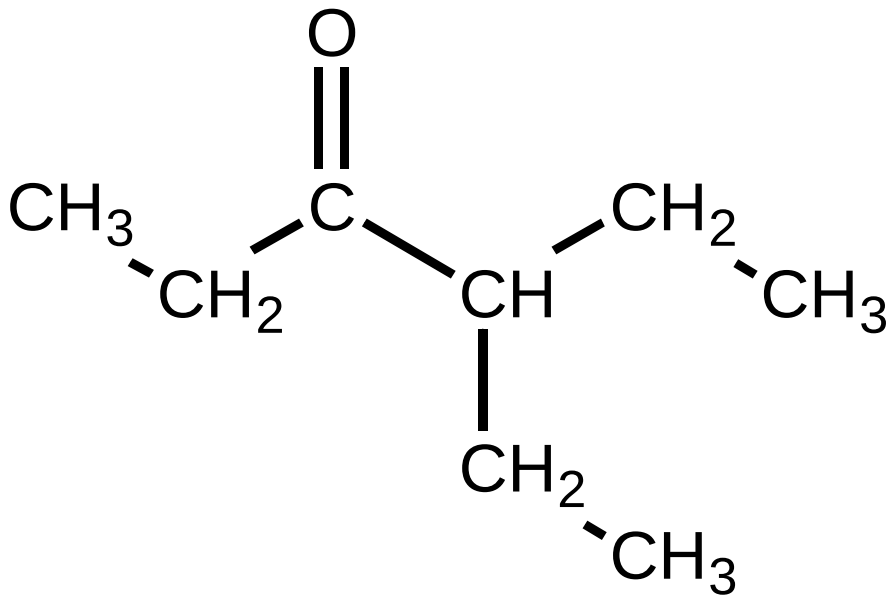
- Choose the longest continuous carbon chain that contains the carbonyl carbon
- Number from the end of the chain closest to the carbonyl carbon
- Ketone ending is ***-one***

Do the ***ketones*** section of Organic Nomenclature program!

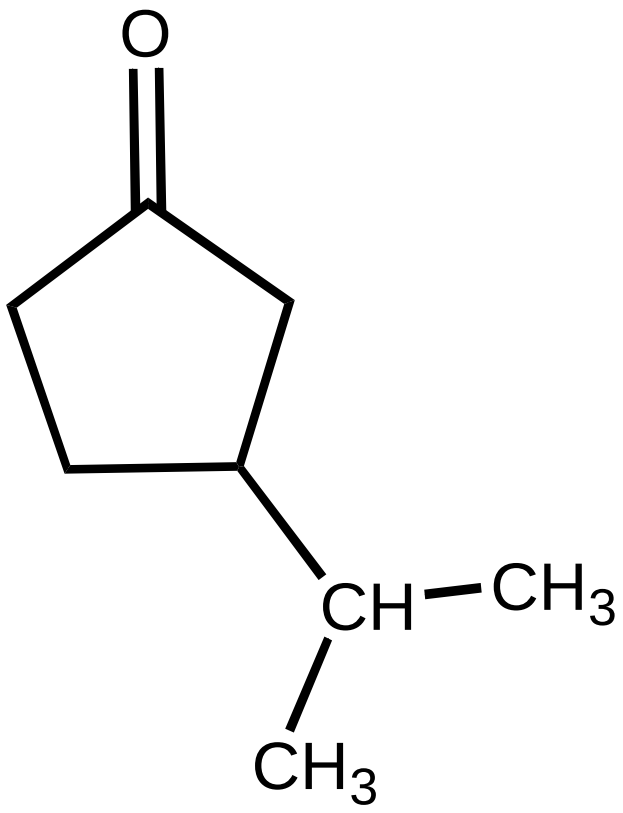
H [D P SOHV



2-Pentanone



4-Ethyl-3-hexanone



3-Isopropylcyclopentanone

Frp p rq#ru#Wuly ldo#Q dp hv

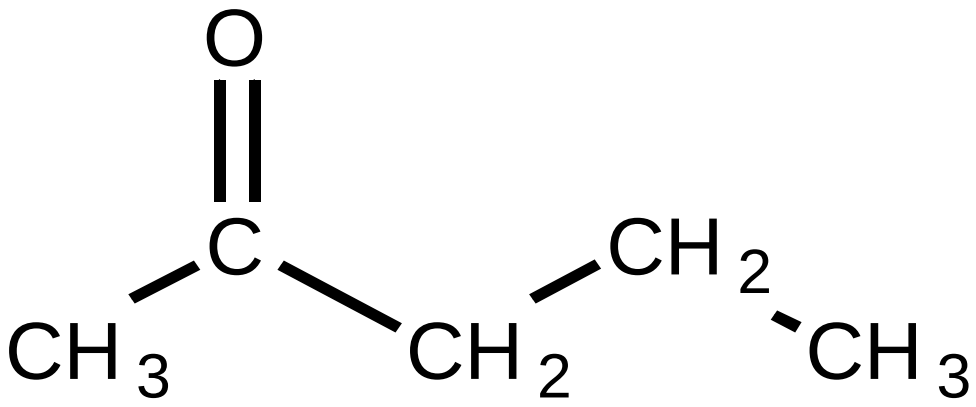
- Q dp h#hdfk#jurxs#dwwdfkhg#wr#wkh#fduerq|c#jurxs#dv#dq#dqn|c#jurxs

- Frp elqh#qwr#d#qdp h/#dffruglqj#wr#wkh#sdwwhuq=

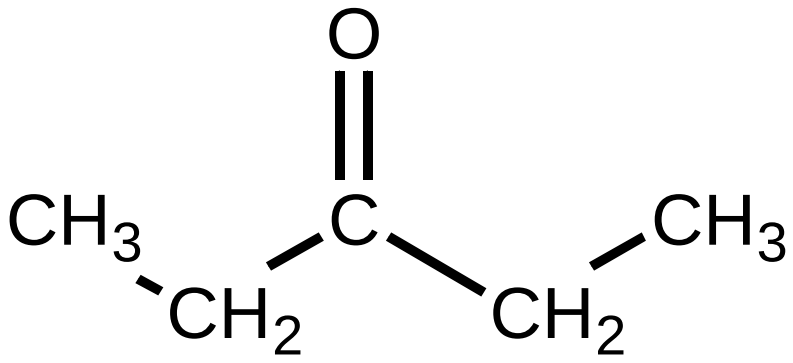
  dqn|c#dqn|cÍ#nhwrqh

  QRWH= Wkly#v#qrw#dc#rqh#z rug$

H{dp sdn#ri#F rp p rq#Q dp hv

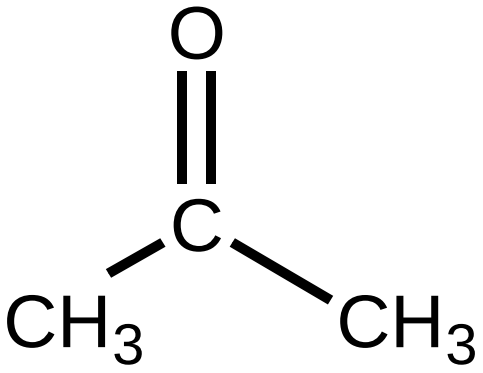


Methyl propyl ketone



Diethyl ketone

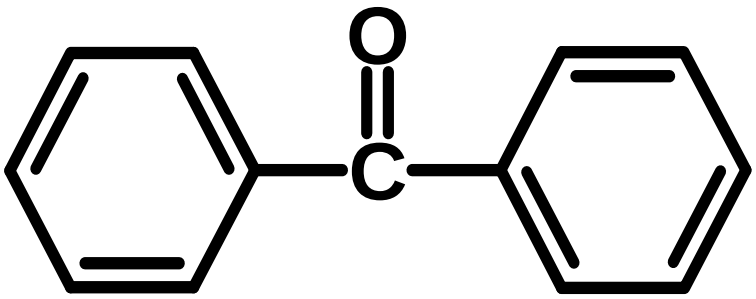
VSHFLDO#FDVHV



dimethyl ketone

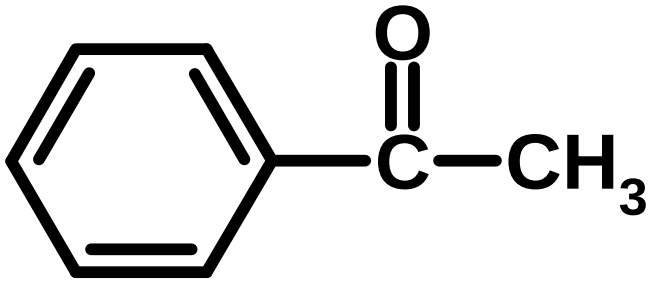
acetone

D#frp p rq#derudwru| vroyhqw#dqg#fdqlqj djhqw



diphenyl ketone

benzophenone



methyl phenyl ketone

acetophenone

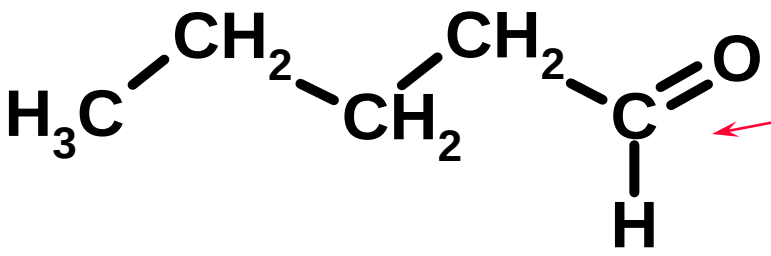
NQRZ WKHVH

IXSDF#Qrphqfodwxuh#ri#Doghk|ghv

- Fkrrvh#wkh#orqjhvw#frqwlqxrxv#fduerq#fkdlq#wkdw#frqwdlqv#wkh#fduerq|o#fduerq
- Qxpehu#iurp#wkh#hqg#ri#wkh#fkdlq#forvhvw#wr#wkh#fduerq|o#fduerq#+fduerq#&4$,
- Doghk|gh#hqglqj#lv#*0do*

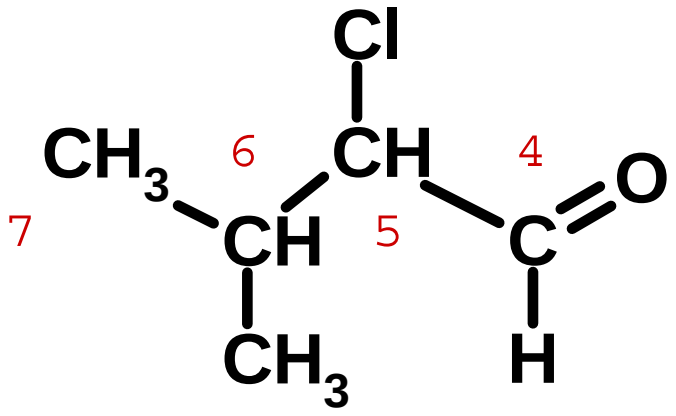
Gr#wkh#*doghk|ghv*#vhfwlrq#ri#Rujdqlf#Qrphqfodwxuh#surjudp1

H [DP SOHV



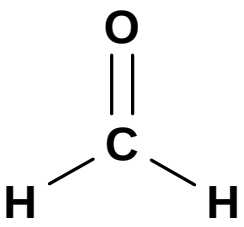
dogh k|gh jurxs#v
doz d|v#fduerq#1

pentanal



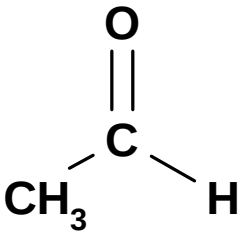
2-chloro-3-methylbutanal

F rp p rq#Q dp hv#r i#W kh#D ogh k|ghv



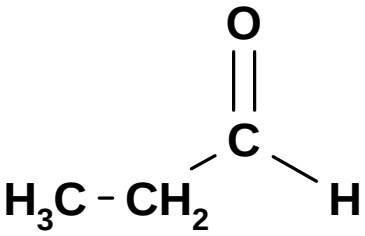
Formaldehyde

1



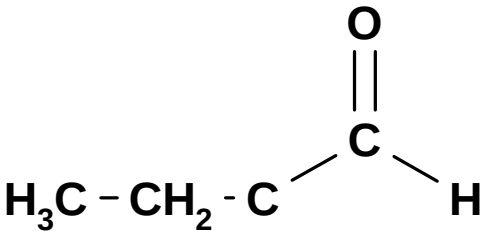
Acetaldehyde

2



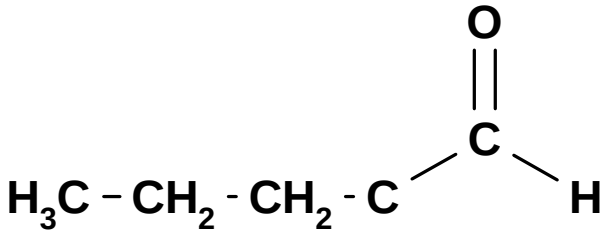
Propionaldehyde

3



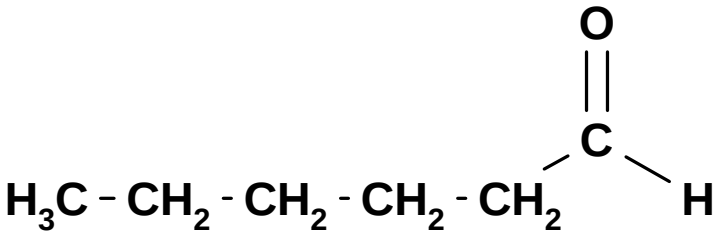
Butyraldehyde

4



Valeraldehyde

5

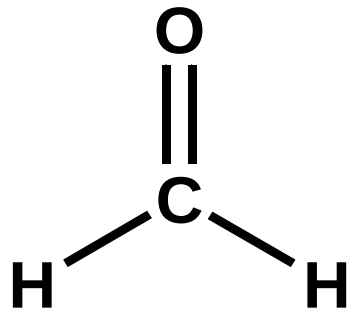


Caproaldehyde

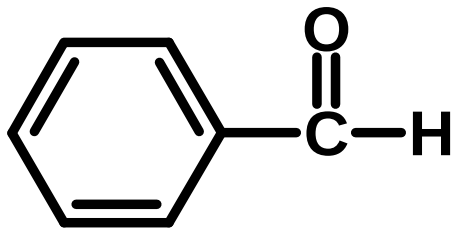
6

UHFRJQL]H WKHVH

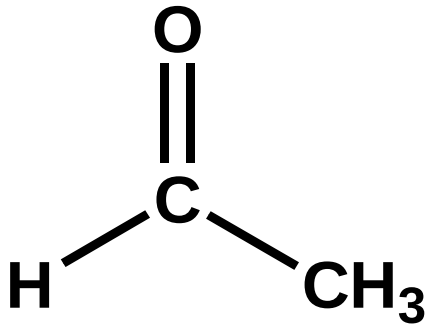
VSHFLDO#FDVHV



formaldehyde



benzaldehyde

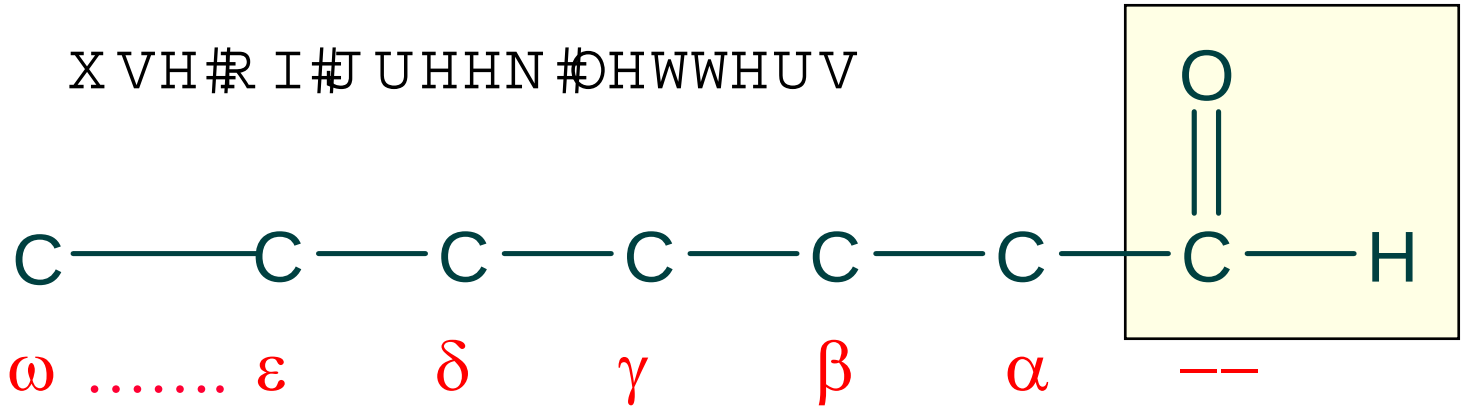


acetaldehyde

NQRZ WKHVH

Irup lqj#Frp p rq#Q dp hv#ri#Doghk|ghv

XVH#R I#JUHHN#DHWWHUV



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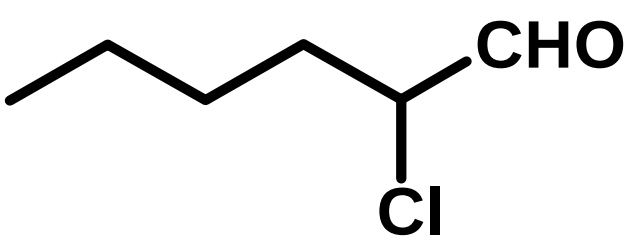
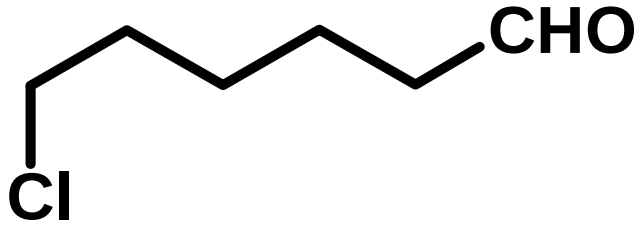


α0fkcrurfdsurdoghk|gh

+#α0fkcrurkh{dqdo,



ω0fkcrurfdsurdoghk|gh

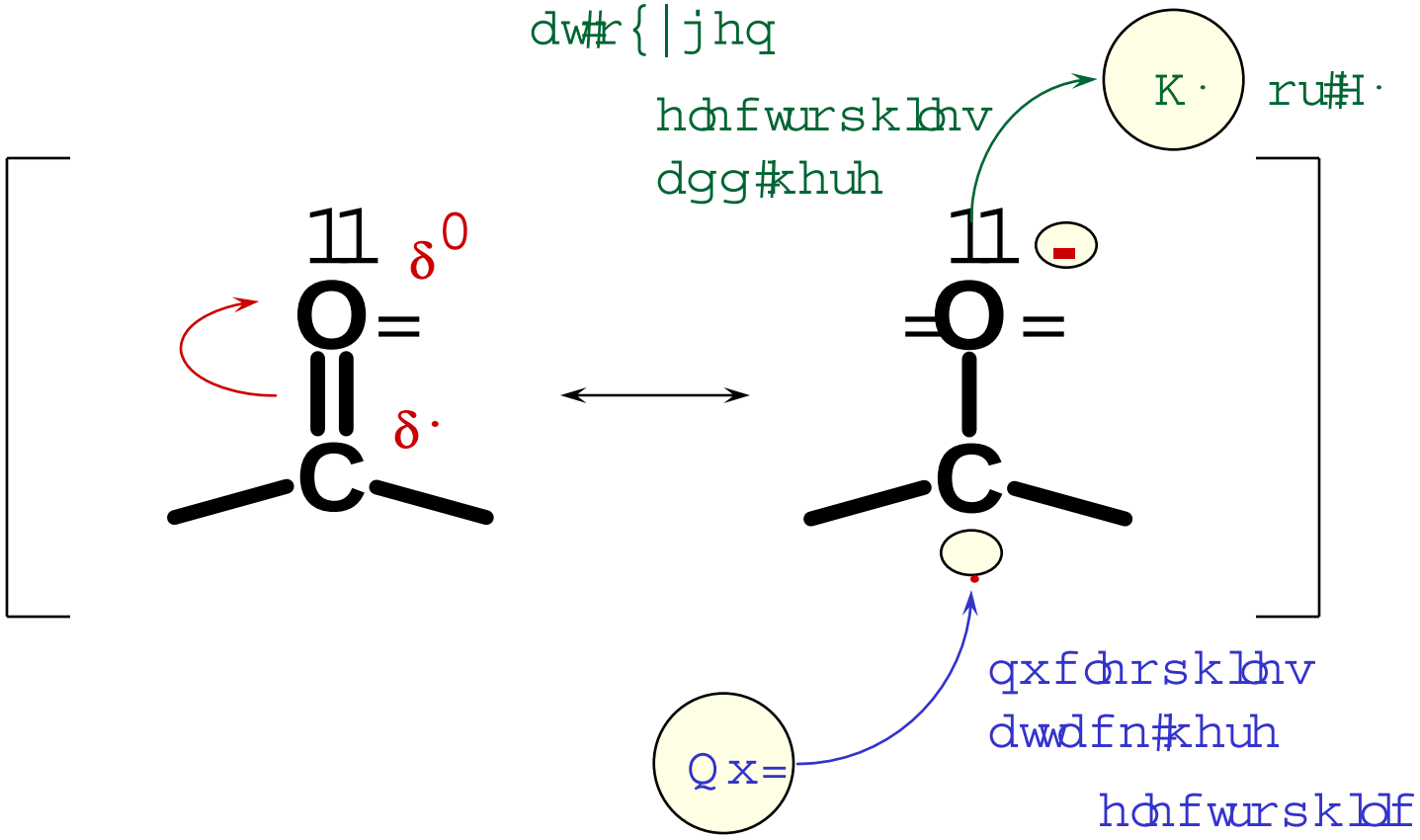
+#ω0fkcrurkh{dqdo,

UHDFWLYLW\#RI#WKH#F@R#JURXS

QXFOHRSKLOLF#DGGLWLRQ

JHQHUDOL]HG#FKHPLVWU\

WKH#FDUERQ\O#JURXS

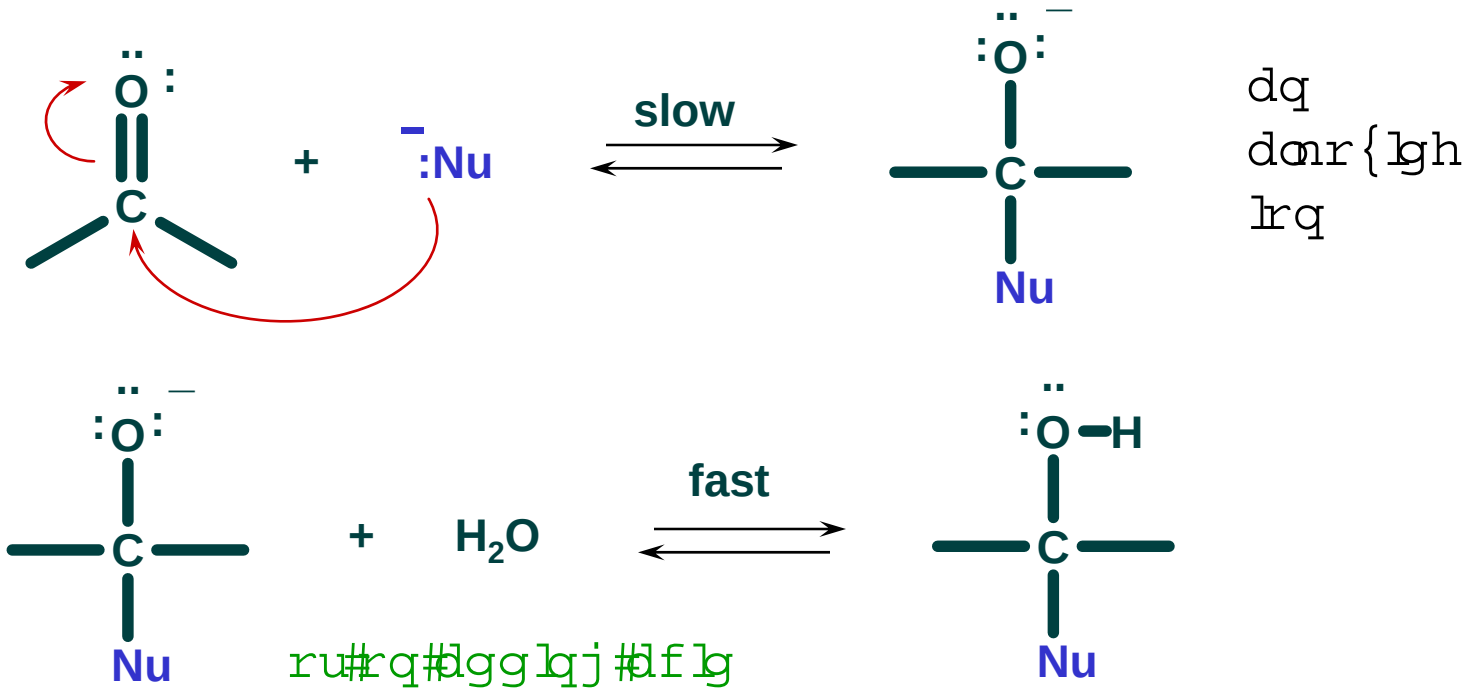


Q X F OHR SK LOLF #D G G LWLR Q #WR #F @R

P HF K DQLVP V

IQ #D F IG #D Q G #Q #E D VH

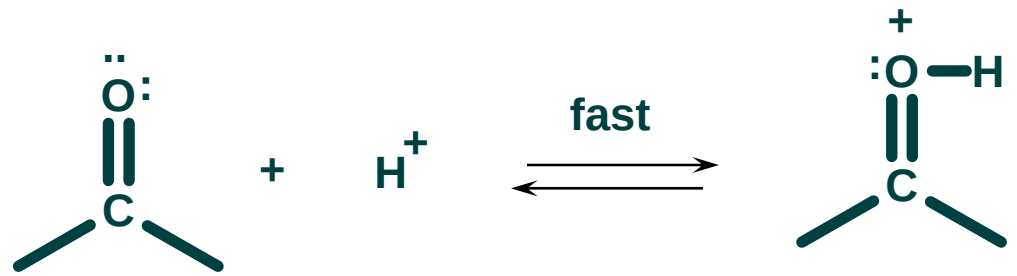
QxfdrskloLf Dgglwlrq#wr#Fduerq|o Edvlf#ru#Qhxwudo#Vrxwlrq



Jrrg#qxfdrskloLhv dqg#vwurqj#edvhv +xvxdoo|#fkdujhg,

EDVLF#VROXWLRQ

Qxfdrsklof Dgglwrq#wr#Fduerq|c# Dflg#Fdwdo|}hq



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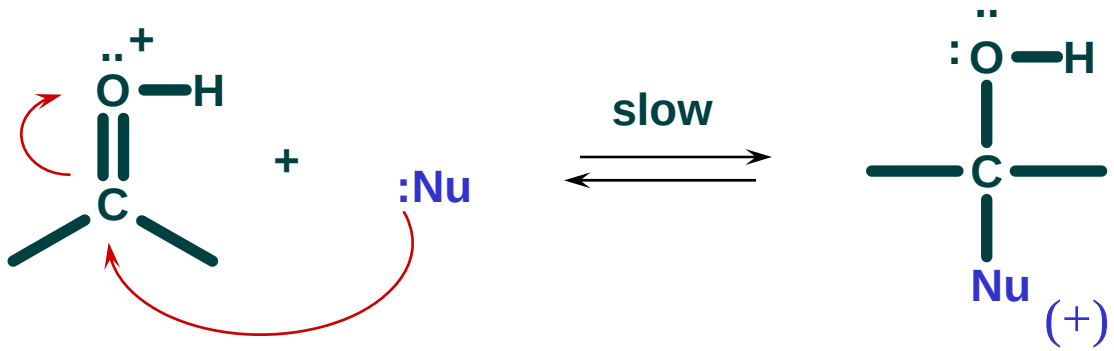


Dflg#fdwdo|vlv#vshhgv#wkh#udwh#ri# dgglwrq#ri#
- z hdn#qxfdrsklohv dqg
- z hdn#edvhv#xvxdoo|#kqfkdujhg,1

DFIGIF#VROXWIRQ

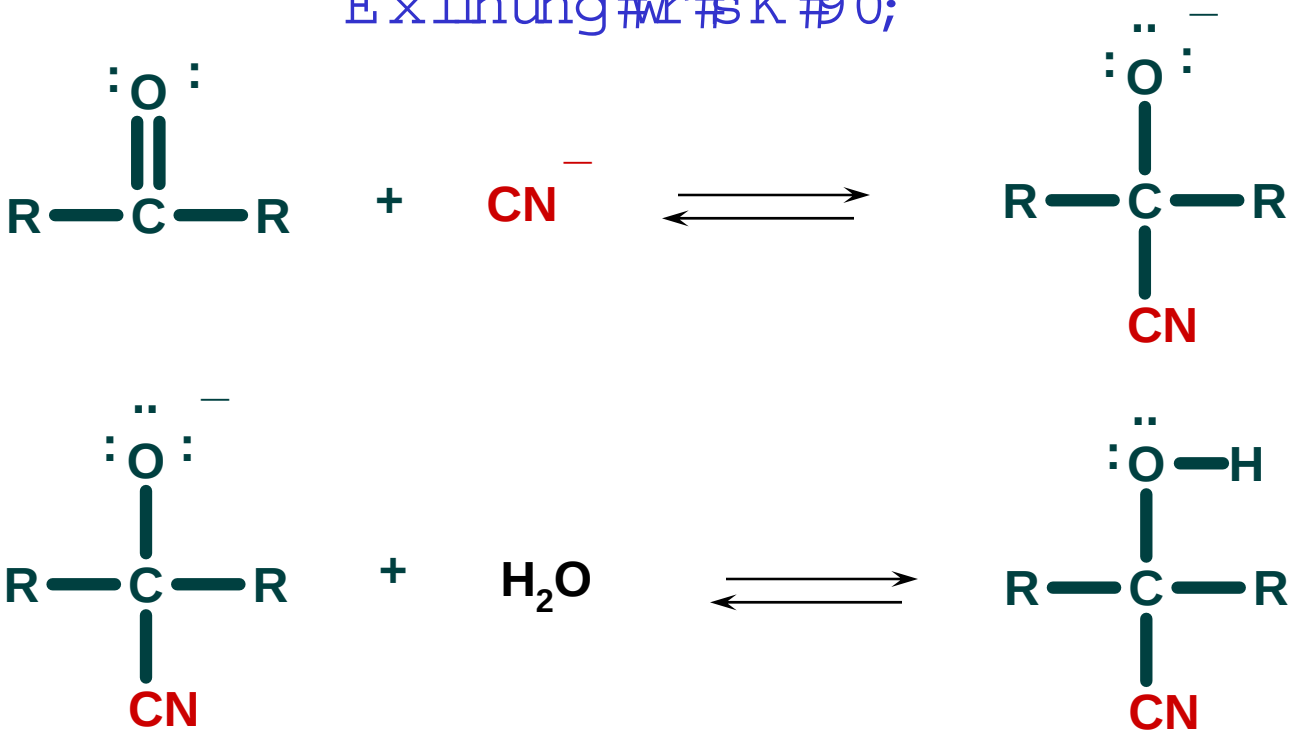
sK#309

vwurqjhu#dflg surwrqdwhv wkh qxfdrskloh

F\DQRK\GUILQV

Dgglwlrq#ri#F|dqlgh

Exiihuhg#wr#sK#90;



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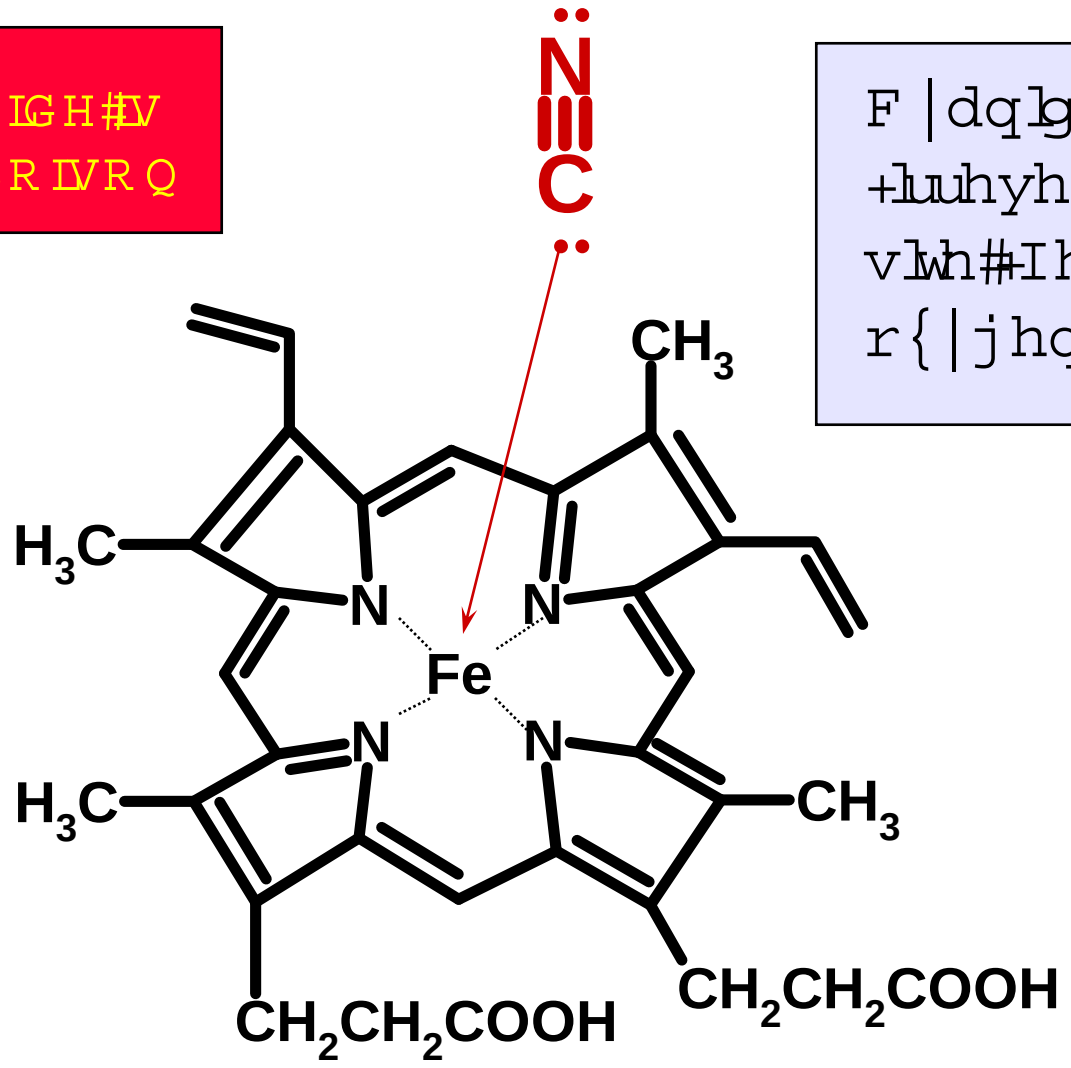
Lq#dflg#vroxwlrq#wkhuh#z rxog#eh#dwwdfn#F0/# dqg#KFQ#j,#z rxog#eh#d#sureohp #srlvrq,1

F\DQLGH#LRQ#ERQGV#WR#KHPRJORELQ

F\DQLGH#LV
LV#D#SRLVRQ



F|dqlgh#erqgv#
+luuhyhuvleo|,#wr#wkh
vlwh#Ih#L,#z khuh
r{|jhq#xvxdoo|#erqgv1

\rx#glh#ri
vxiirfdwlrq#D
odfn#ri#r{|jhq1

KFQ#lv#d#jdv#wkdw#|rx#fdq#hdvlo|#euhdwkh#qwr#|rxu#xqjv1

R U J D Q R P H W D O O I F V

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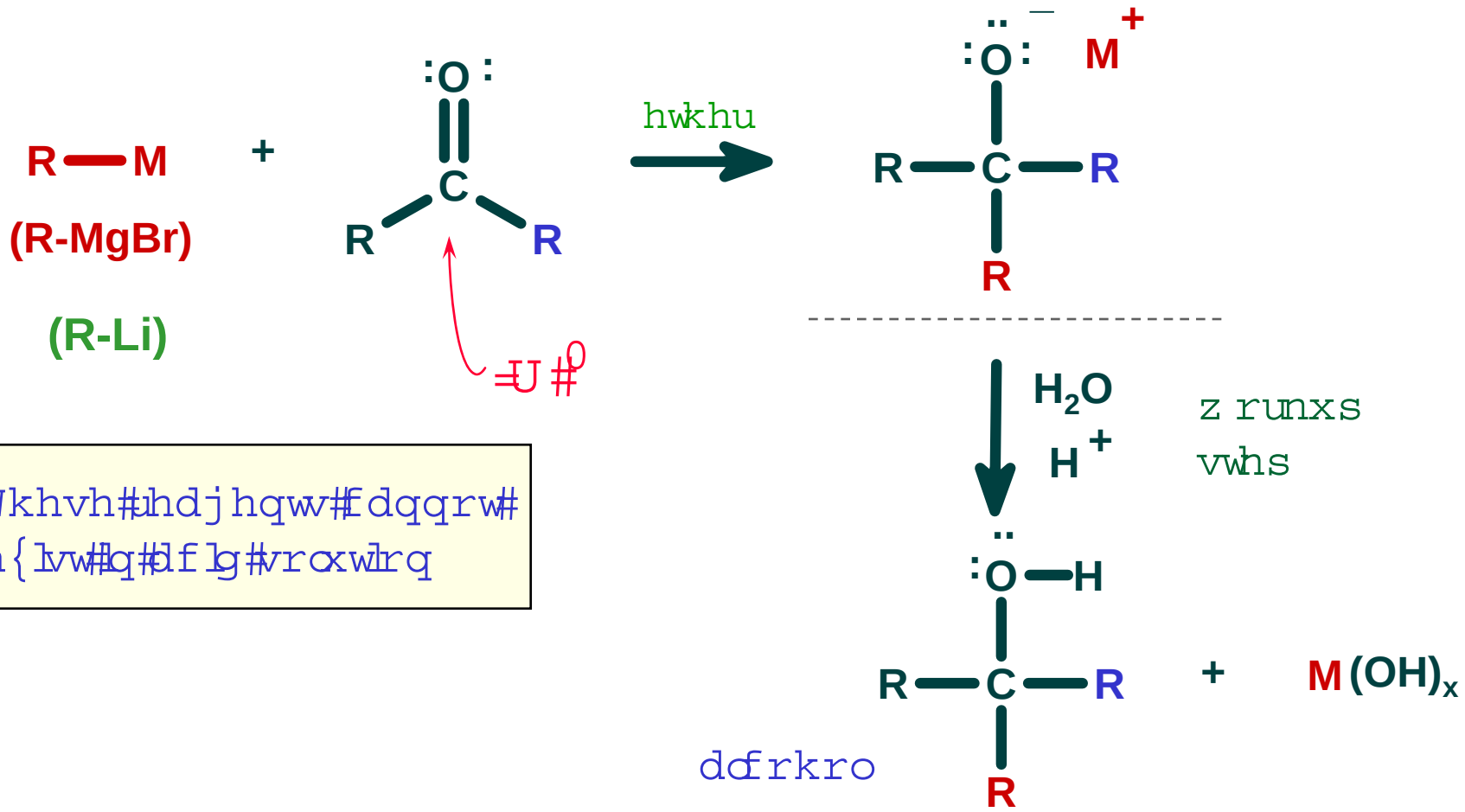

Wkhvh#uhdjhqw#fdqqrw#
h{lvw#q#dflg#vroxwlrq

Vxp p du|#ri#Jhdfwlrqv#ri# Rujdqrp hwdoolfv z lwk# Fduerq|d#Frp srxqgv

Dod#uhylhz wr#|rx

- Rujdqrp hwdoolfv z lwk#nhwrqhv |lhog#
  whuwldu/ dcfrkrov
- Rujdqrp hwdoolfv z lwk#dqhk|qhv |lhog#
  vhfrqgdu/ dcfrkrov
- Rujdqrp hwdoolfv z lwk#irup doghk|gh |lhog
  sulp du/ dcfrkrov1
- Rujdqrp hwdoolfv z lwk#fduerq#gr{lgh |lhog
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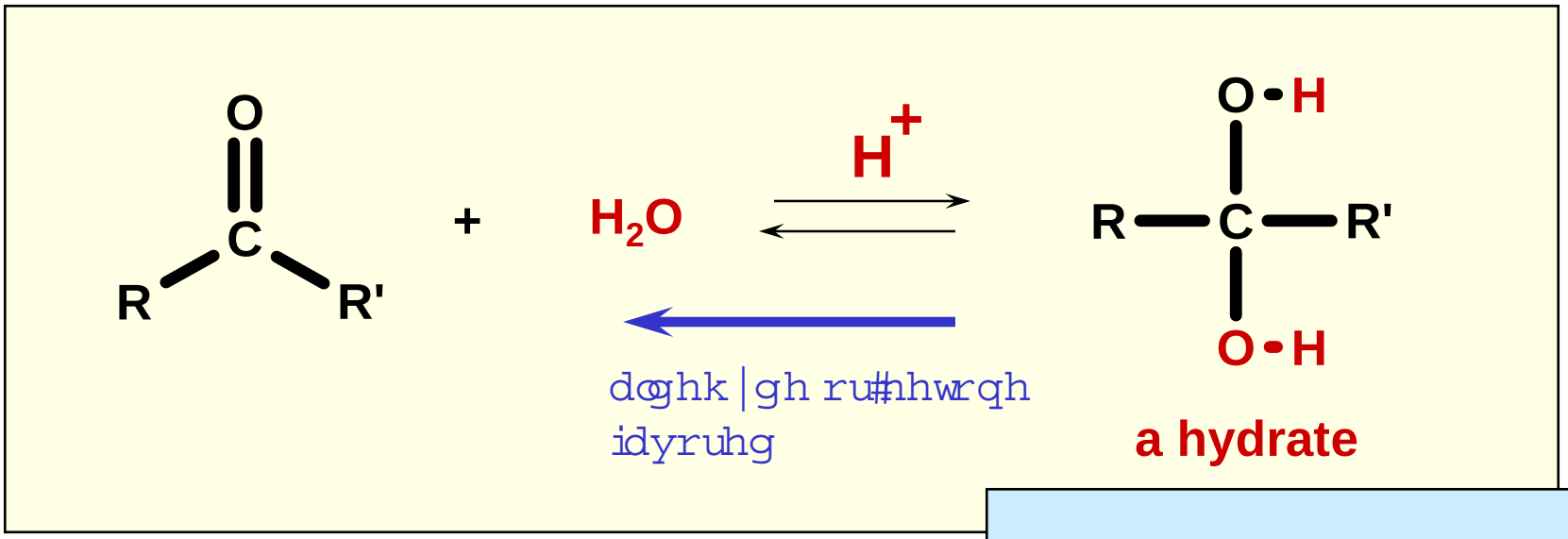
hwf1


K\GUDWHV

Dgglwlrq#ri#Z dwhu

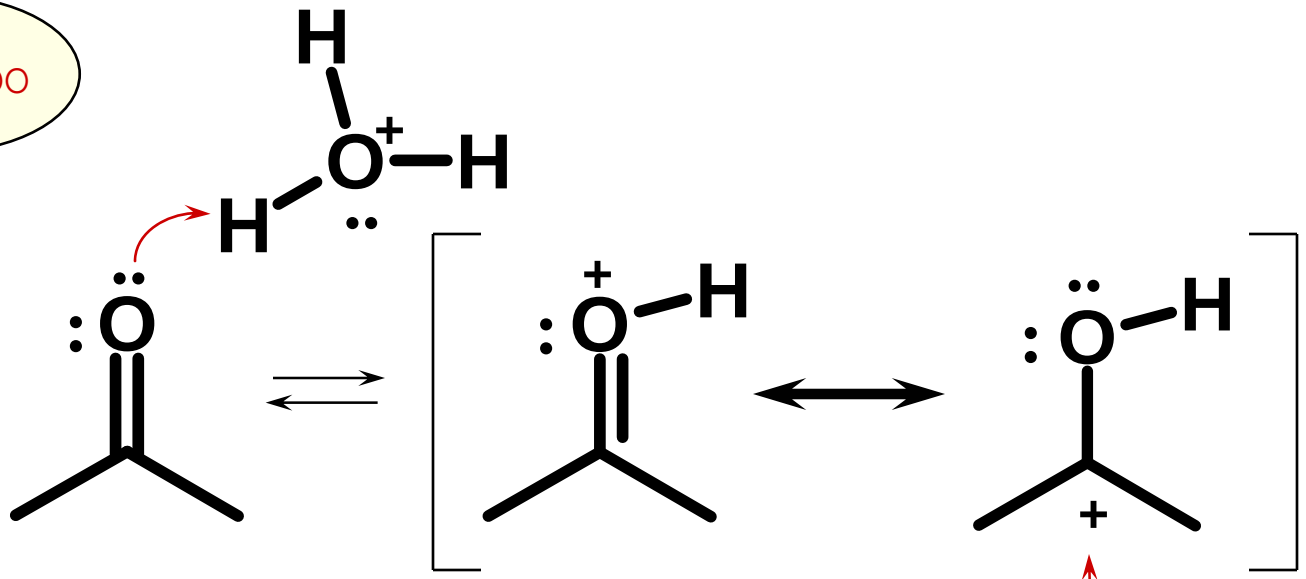


k|gudwhv#duh#kqvwdedn
dqg#fdqqrw#eh#lvrodwhg
lq#p rvw#fdvhv

p rvw#k|gudwhv#ihyhuw#r#dq#doghk|gh
ru#hwrqh dv#vrrq#dv#wkh|#irup

DFIG#FDWDO\VLV

UHFDOO



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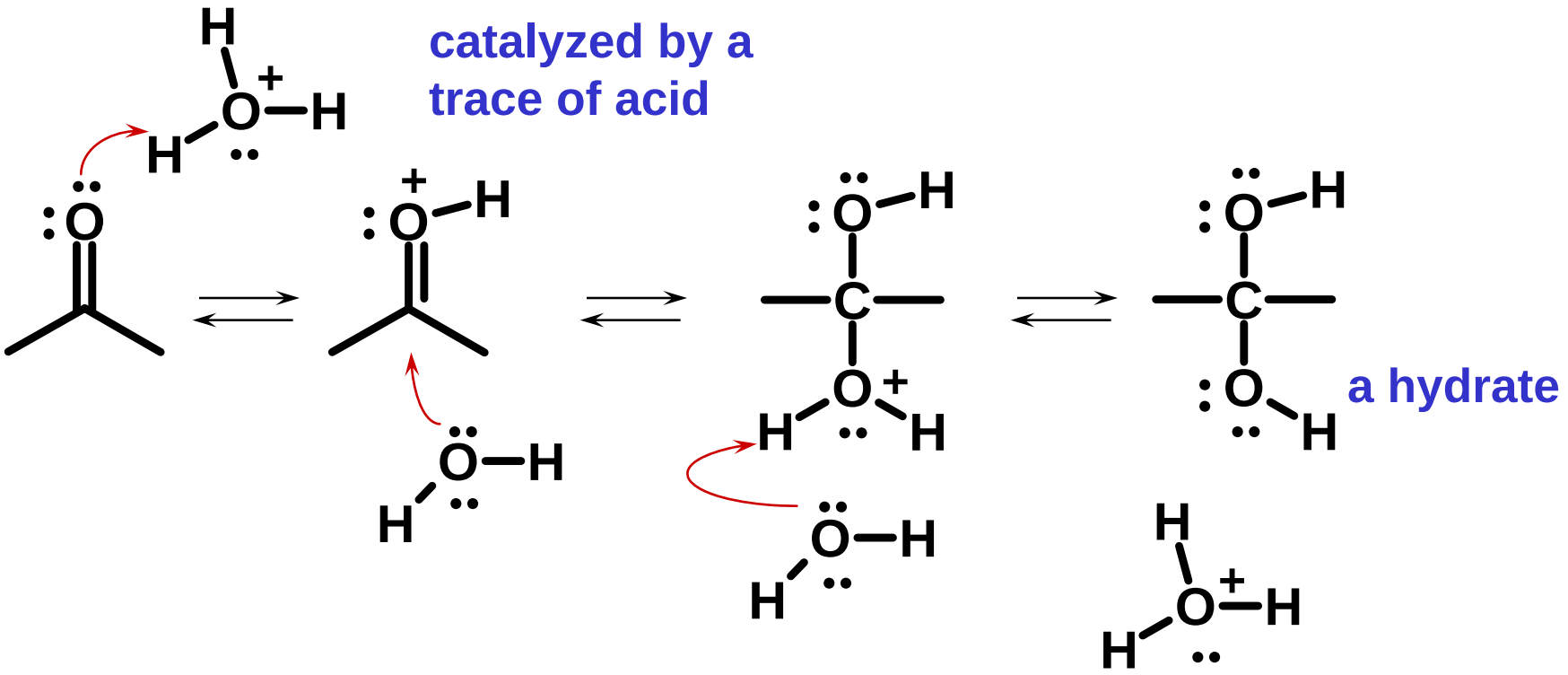
ri#wkh#fduerq|d#jurxs#Oqxfohrskloldf
dgglwlrq#surfhhgv#p ruh#hdvlo|1

=Q x

z hdn#qxfohrskloldv
fdq#hdfw

Z dwhu#lv#d#z hdn#qxfohrskloh1

Z DWHU#DGGV#WR #WKH#F DUE R Q\O#J U R X S#R I# DOGHK\GHV#DQG#NHWR QHV#WR #IR UP #K\GUDWHV



for most compounds the equilibrium favors the starting materials and you cannot isolate the hydrate

P IF UR UHYHUVIE LOLW\= Lq#d#hdfwrq#z khuh#do#vwhsv#duh uhyhuvleh/#wkh#vwhsv#q#wkh#hyhuvh uhdfwrq#duh#wkh#vdp h#dv#wkrvh#q wkh#ruz dug#hdfwrq/#hyhuvhg$

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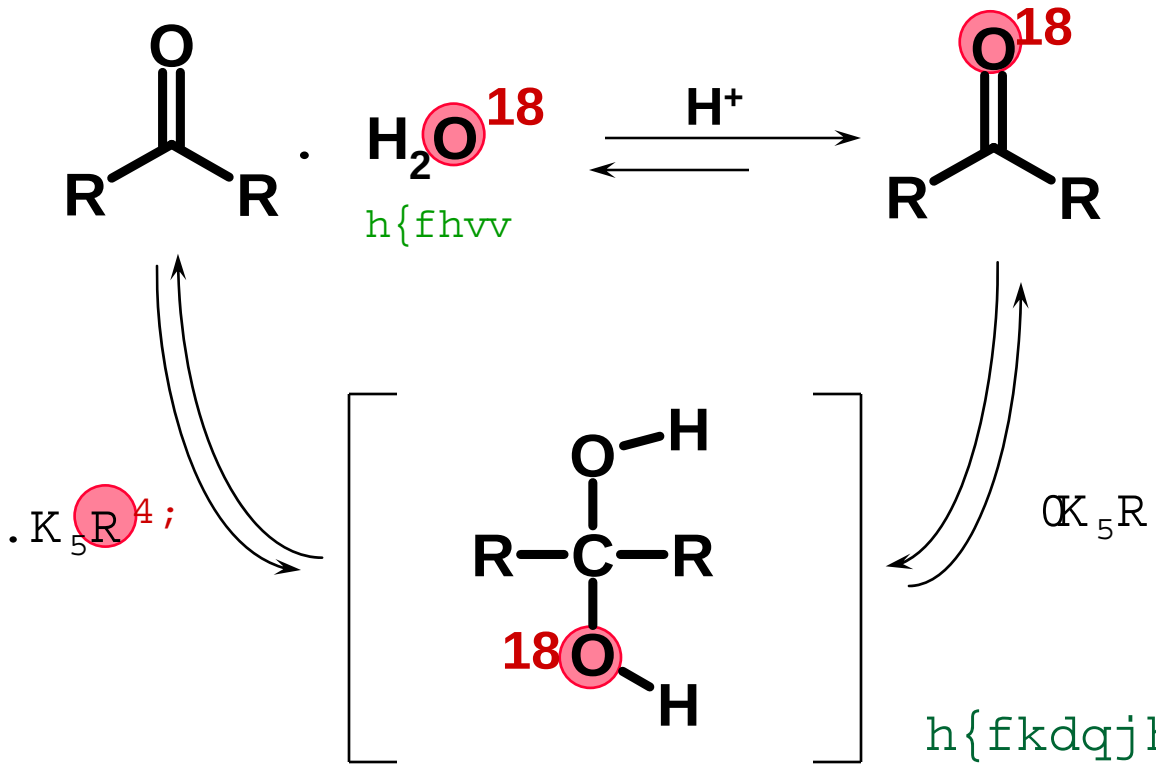
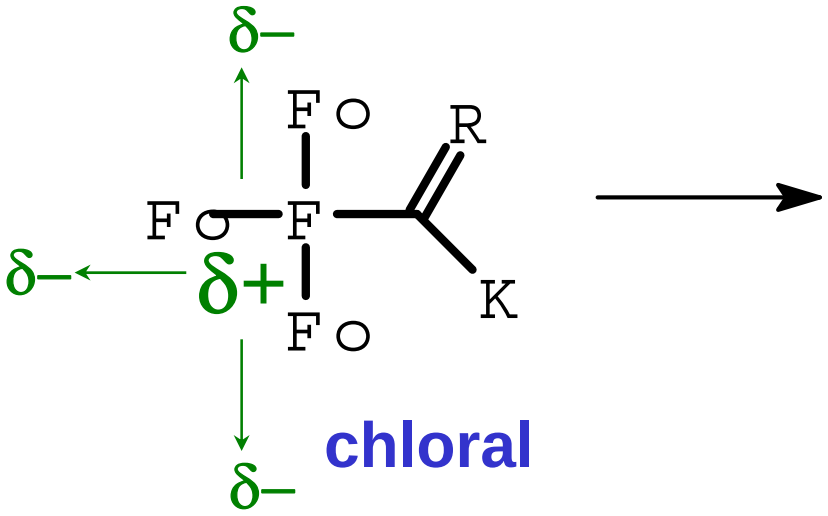


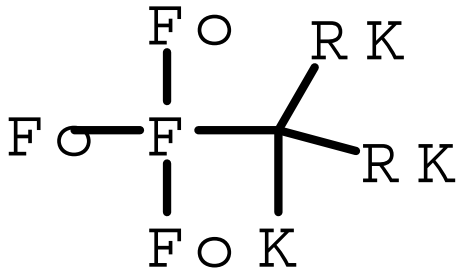
h{fkdqjh#vkrz v#wkh#suhvhqfh#ri#d#v|p p hwulf lqwhup hgldwh

SOME STABLE HYDRATES

these also indicate that hydrates are possible

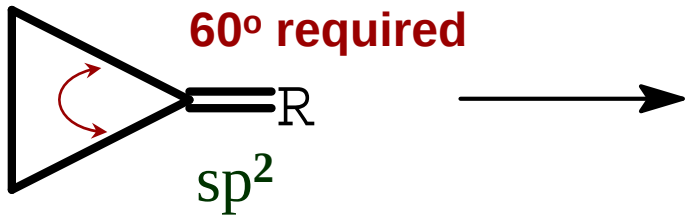


chloral

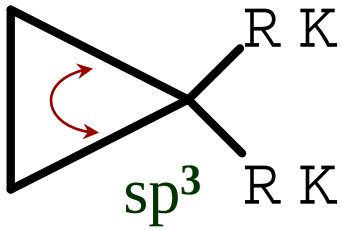


chloral hydrate

120° expected
60° required



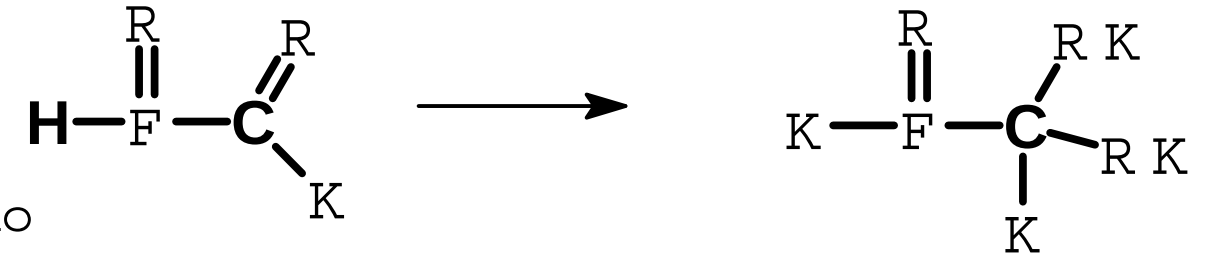
cyclopropanone



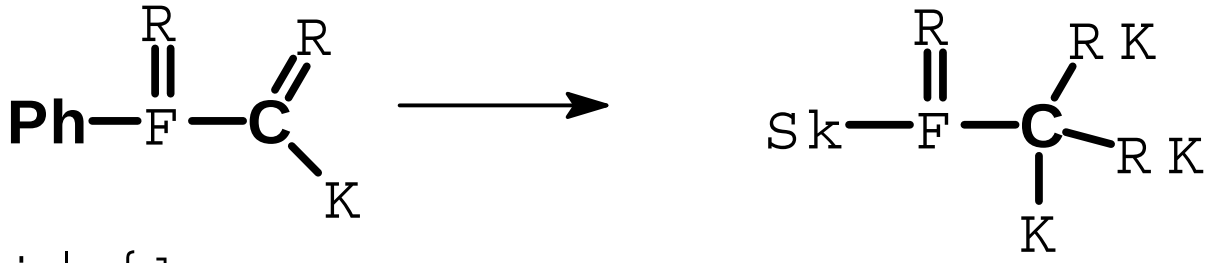
109° expected
60° required

cyclopropanone hydrate

SOME ADDITIONAL STABLE HYDRATES



jo|r{do

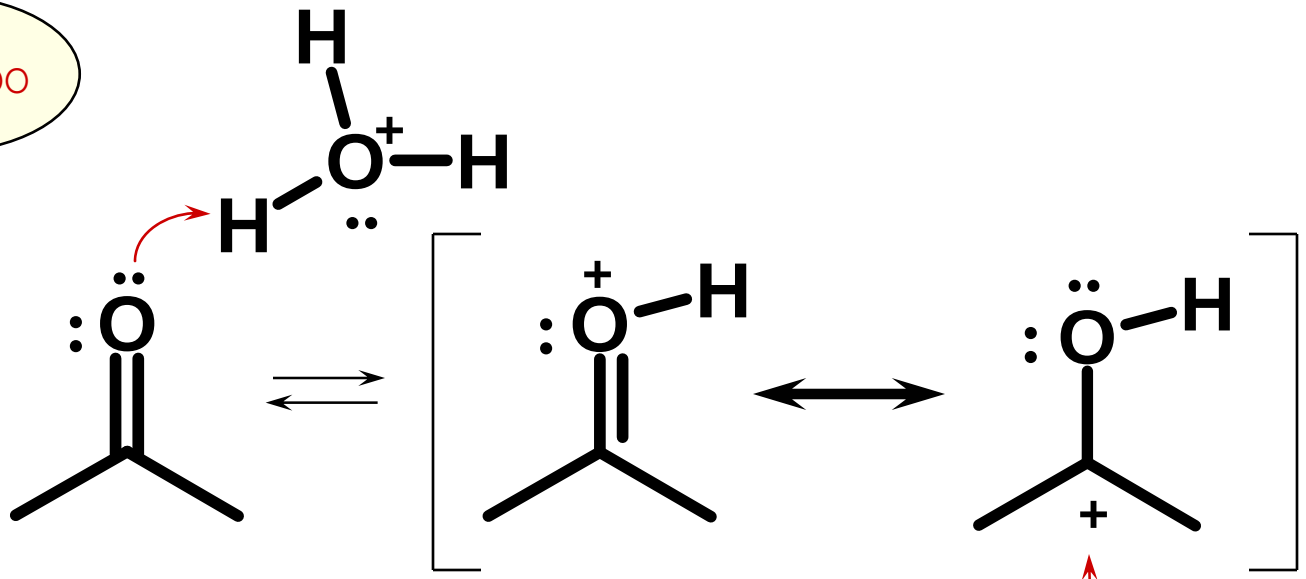


skhq|oj o|r{do

DFHWDOV#DQG
KHP DDFHWDOV

DFIG#FDWDO\VLV

UHFDOO



Dflg#fdwdo|vlv#nqkdqfhv#wkh#hdfwlylw|
ri#wkh#fduerq|d#jurxs#Oqxfohrsklof
dgglwrq#surfhhgv#p ruh#hdvlo|1

=Q x

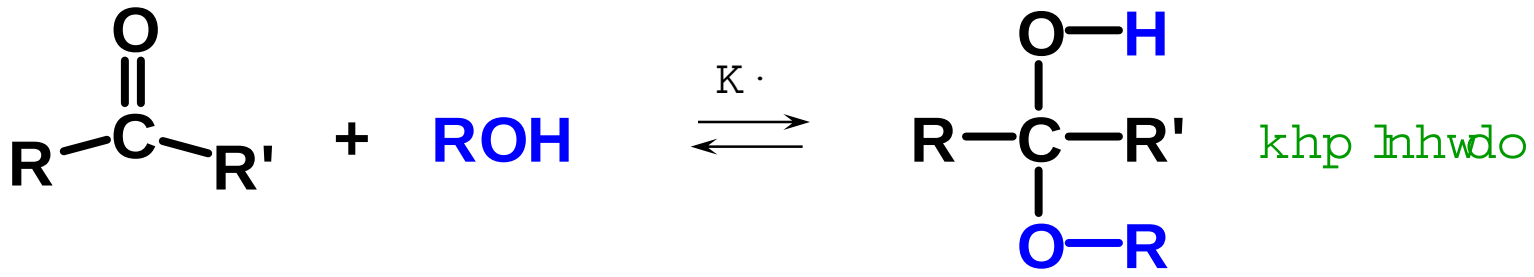
z hdn#qxfohrsklohv
fdq#hdfw

Dcfrkrov#duh#z hdn#qxfohrsklohv1

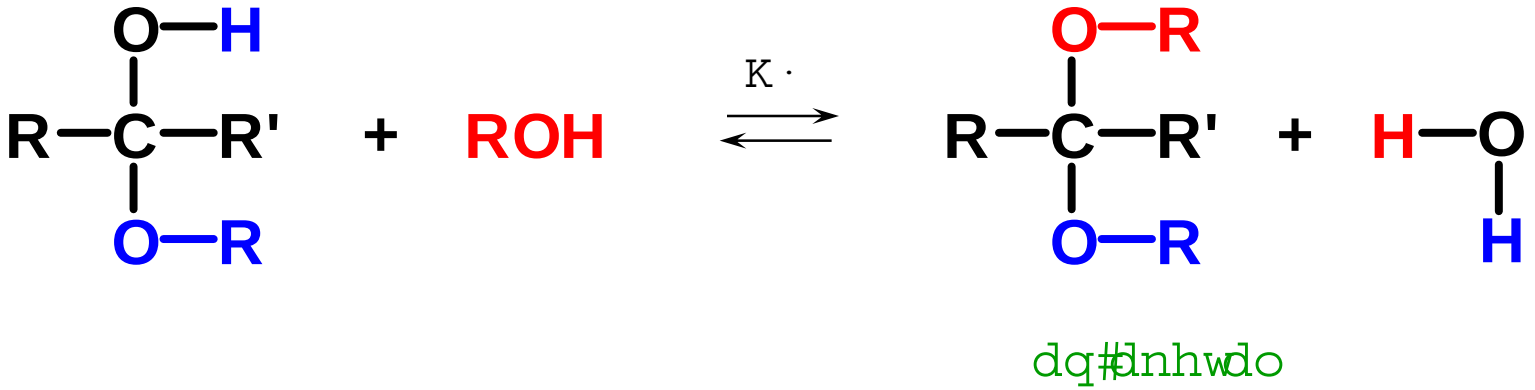
Dggl wlrq#r i#D dfrkrov

WZ R#P ROHV#R I#DOFRKRO#Z LOO#DGG

addition of one mole

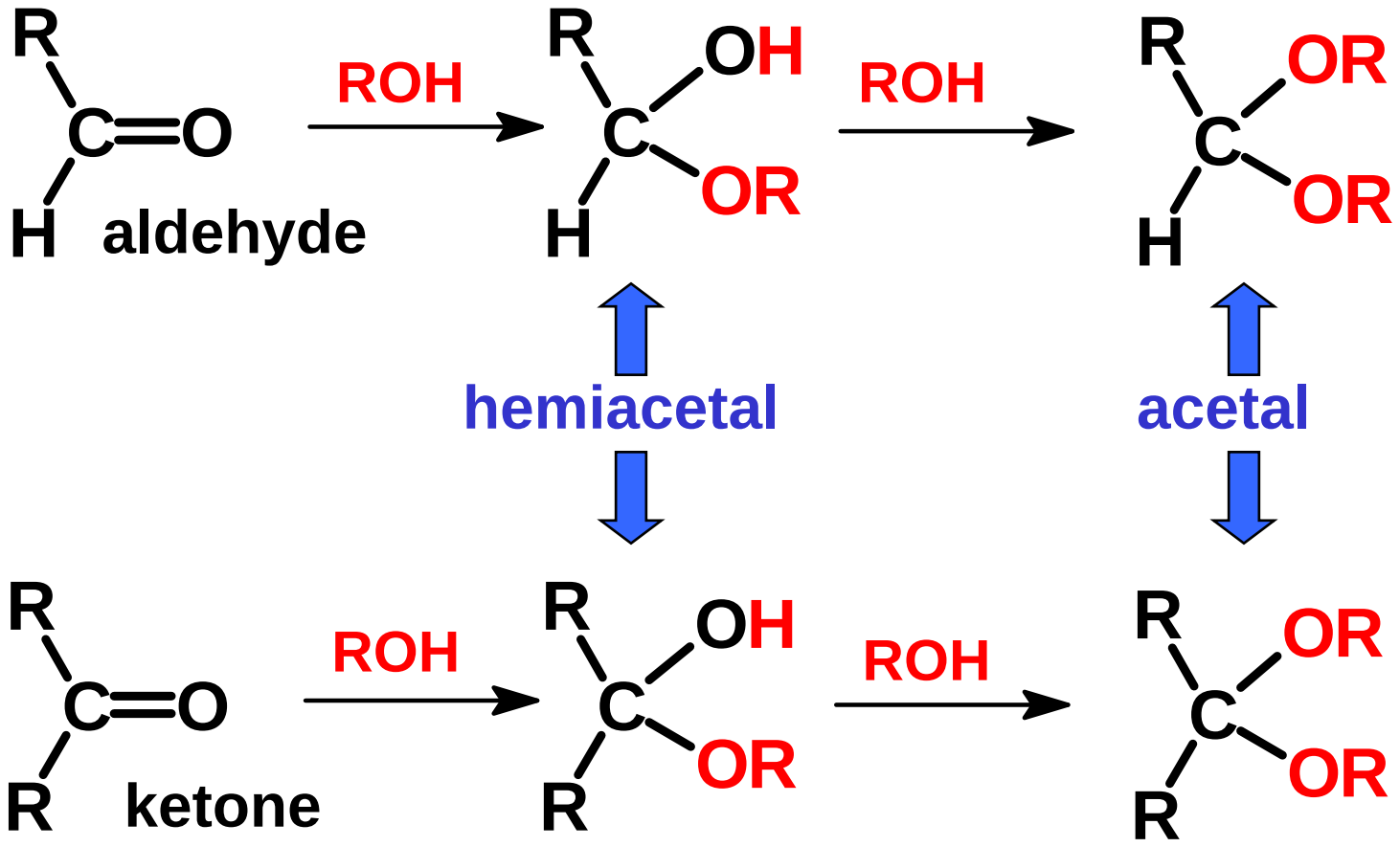


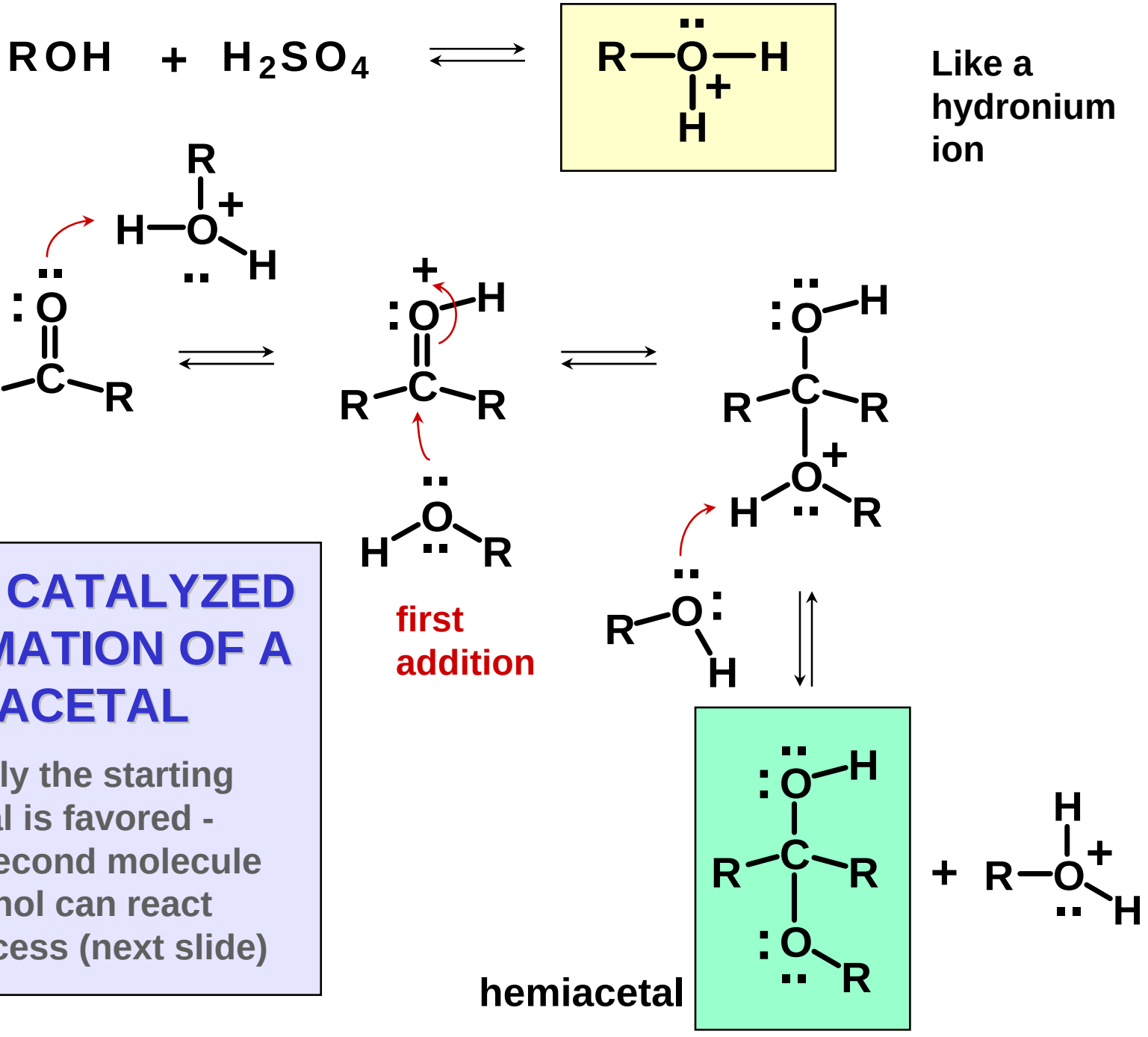
addition of second mole



Wkh#htxldeuld qrup doo|#dyruwkh#dqhk|gh ru#nhwrqh vwduwlqj p dwhuldo/#exw#z h#z loo#vkrz #krz #wkh|#fdq#eh#p dgh1

ACETALS AND HEMIACETALS

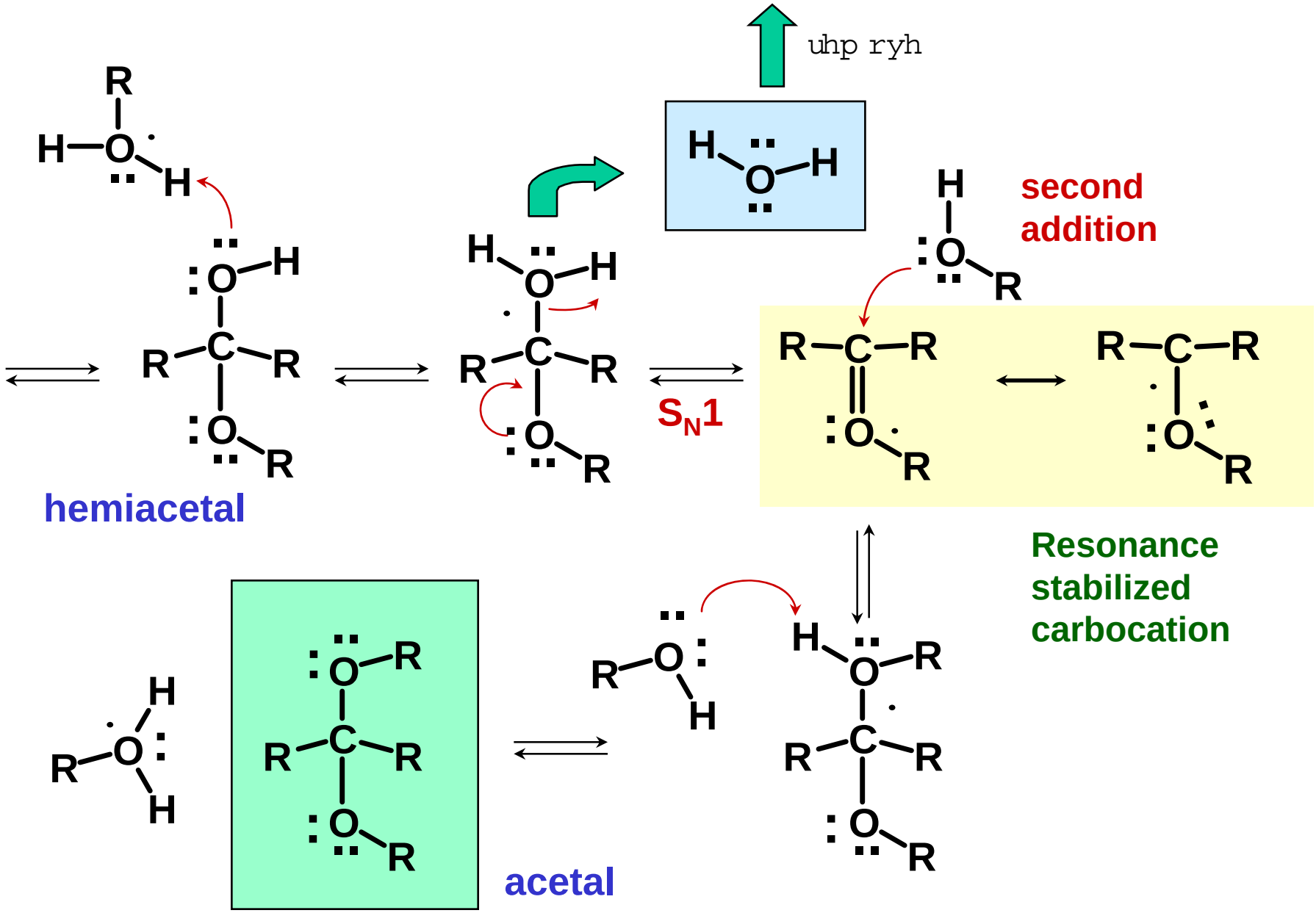




ACID CATALYZED FORMATION OF A HEMIACETAL

Normally the starting material is favored - but a second molecule of alcohol can react if in excess (next slide)

FORMATION OF THE ACETAL (from the hemiacetal)

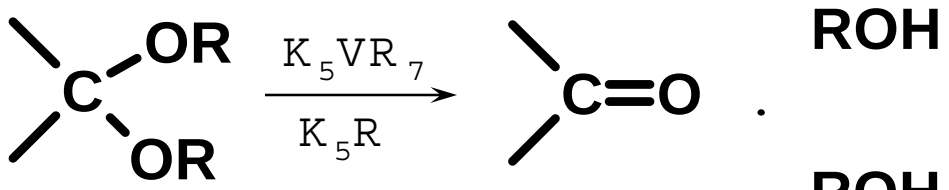


VWDELOLW\#R I#DFHWDOV#DQG#KHPLDFHWDOV

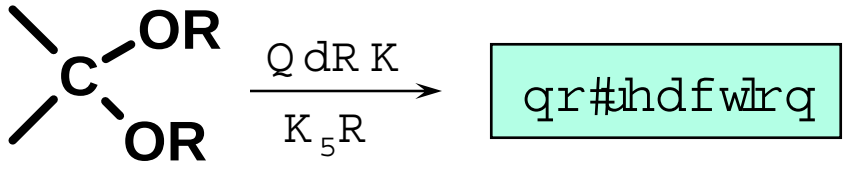
P rvw#khp ldfhwdov duh#qrw#vwdeoh/#h{fhsw#ru#khrvh#ri#vxjduv +vhh#dwhu,1

Dfhwdov duh#qrw#vwdeoh#lq#dtxhrxv#dflg/#exw#kh|#duh#vwdeoh#wr# dtxhrxv#edvh1

DTXHRXV DFLG



DTXHRXV EDVH

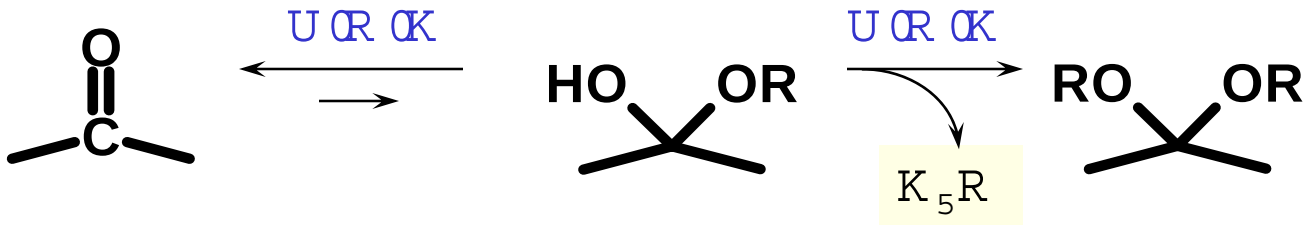


DGGLWLRQ#RI#Z DWHU#DQG#DOFRKROV

Z DWHU

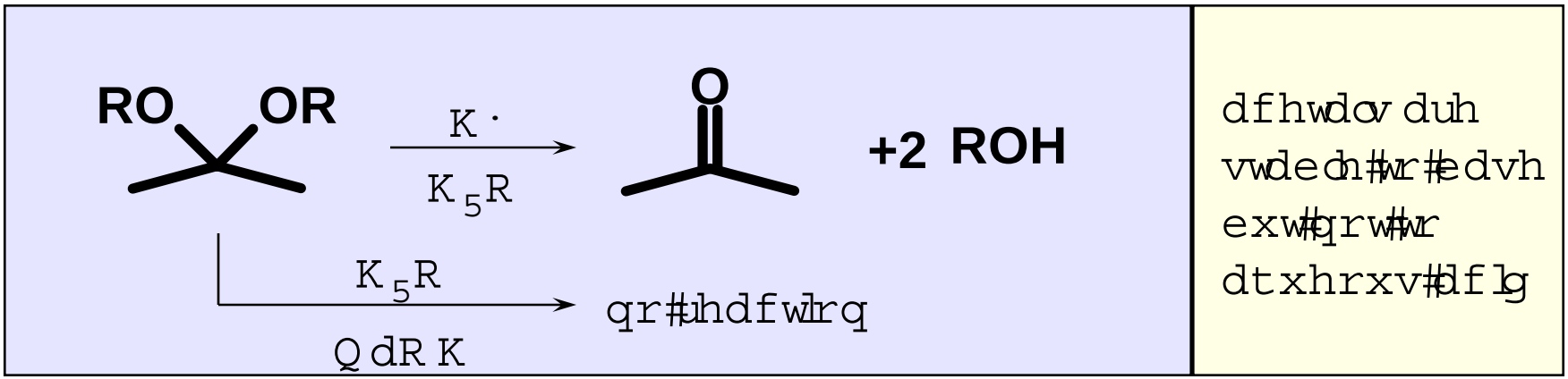
k|gudwh

DOFRKROV



khp ldfhwdo

dfhwdo



dfhwdov duh
vwdeh#wr#edvh
exw#qrw#wr
dtxhrxv#dflg

REAKSI OKSIDASI

OKSIDASI ALDEHID DAN KETON

- Keton tidak mudah dioksidasi
- Aldehid sangat mudah dioksidasi, menjadi asam karboksilat

Zat pengoksidasi : $KMnO_4$, H, H_2O

Reaksi Reduksi

Reaksi Reduksi

- Reduksi aldehid menghasilkan alkohol primer
- Reduksi keton menghasilkan alkohol sekunder
- Zat pereduksi:

  H2, katalis

  Zn/Hg, HCl

Reaksi Adisi-eliminasi

Reaksi Adisi-eliminasi

- Aldehid + Amina Primer ⟶ Imina
- Aldehid + Amina sekunder ⟶ Enamina
- Aldehid + Amina tersier ⟶ hidrazon

Ramalkan produk hemiasetal atau hemiasetal siklik dari:

1. 5-hidroksi-2-heksanon dengan air
2. 1,3,4,5,6-pentahidroksi-2-heksanon dengan air
3. propanal dengan metanol
4. Aseton dengan 1,2,3-propanatriol

Ramalkan apa produk reaksi sikloheksanon dengan :

1. CH3NH2
2. (CH3)2NH