

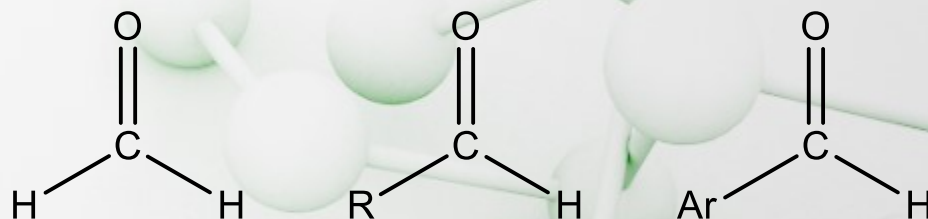
Química Orgânica Aplicada a Biologia

Aula 13

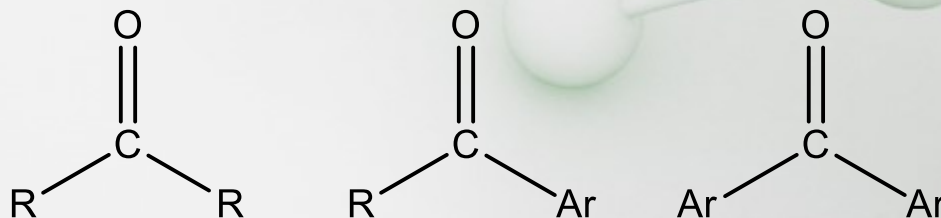
Estudo das cetonas e aldeídos

1. Introdução

- Os aldeídos e cetonas são estruturalmente semelhantes, pois ambos possuem a **carbonila** como **grupo funcional**;
- A diferença é que nos **aldeídos** a **carbonila** está ligada a um **hidrogênio** e a um **grupo alquila ou arila**, enquanto nas **cetonas** a **carbonila** está ligada a **dois grupos alquila ou arila**;



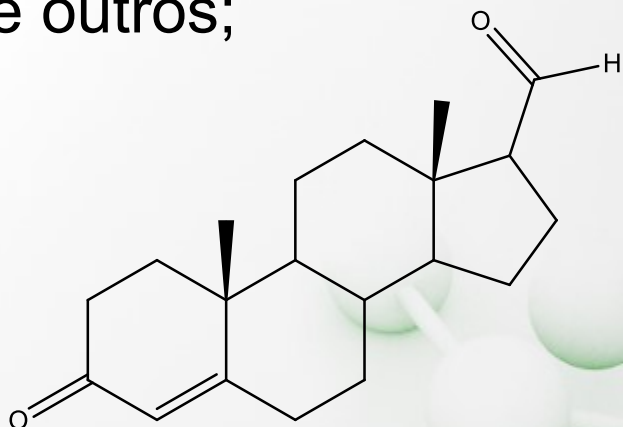
Aldeídos



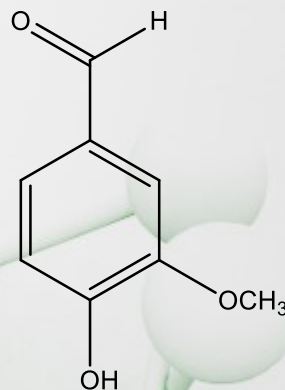
Cetonas

1. Introdução

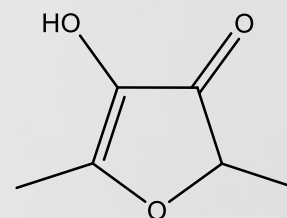
- Aldeídos e cetonas são amplamente encontrados na natureza, em fragrâncias, corantes, hormônios, açúcares, dentre outros;



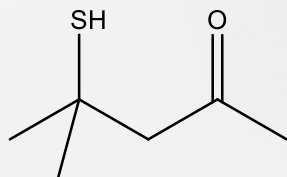
Progesterona
(hormônio feminino)



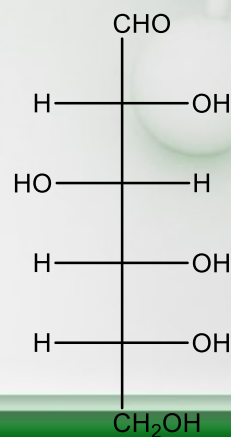
Vanilina
(Aromatizante)



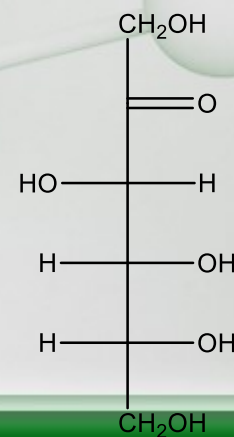
Furaneol
(Aroma artificial de morango)



Responsável pelo odor
da urina dos gatos

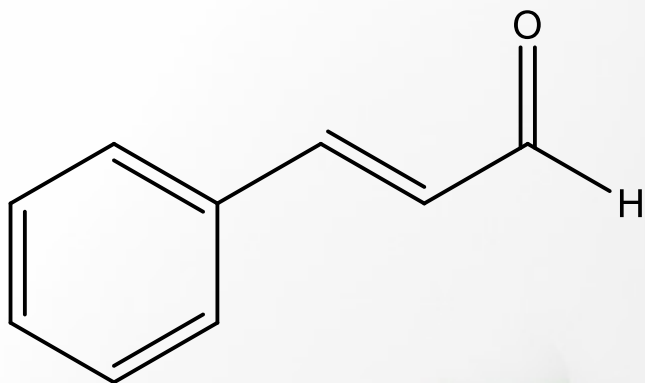


D-Glicose

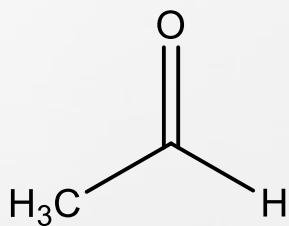


D-Frutose

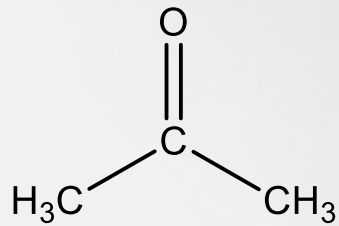
1. Introdução



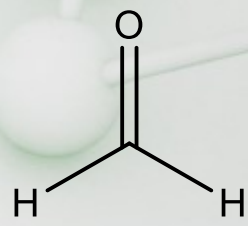
Cinamaldeído
(Odor da canela)



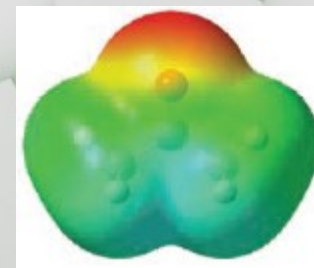
Acetaldeído



Acetona

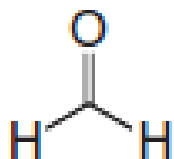


Formaldeído

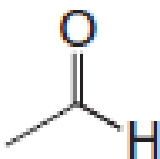


Acetona

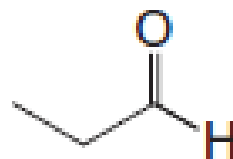
2. Nomenclatura: Aldeídos



Metanal
(Formaldeído)



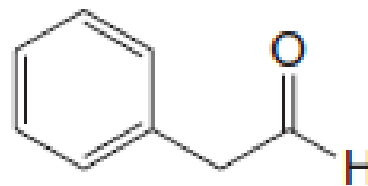
Etanal
(Acetaldeído)



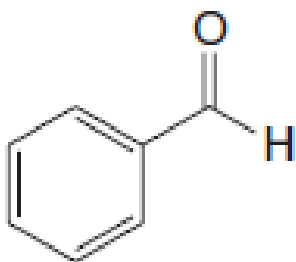
Propanal
(Propionaldeído)



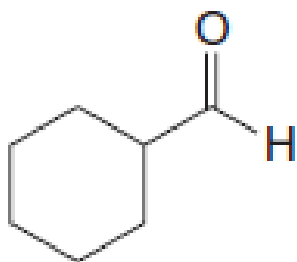
5-Cloropentanal



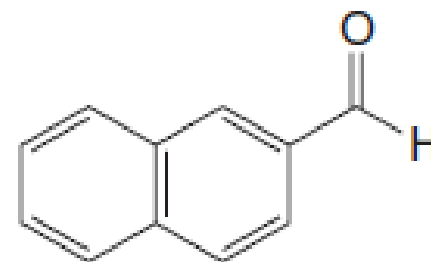
Feniletanal
(Fenilacetaldeído)



Benzenocarbaldeído
(Benzenaldeído)

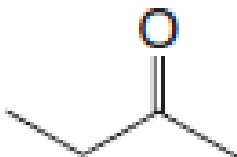


Cicloexanocarbaldeído

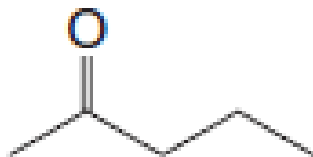


2-Nafatalenocarbaldeído

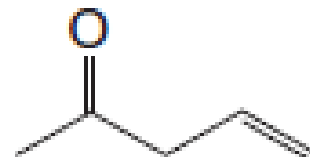
2. Nomenclatura: Cetonas



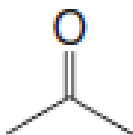
2-Butanona
(Etil metil cetona)



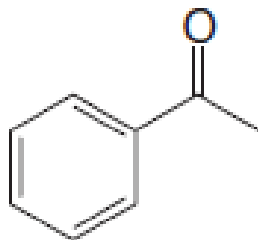
2-Pentanona
(Metil propil cetona)



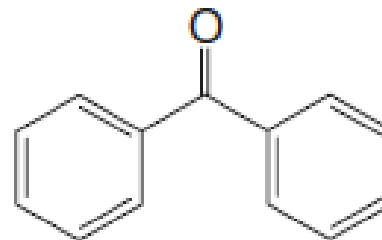
Pent-4-en-2-ona
(Alil metil cetona)



Acetona
(Propanona)



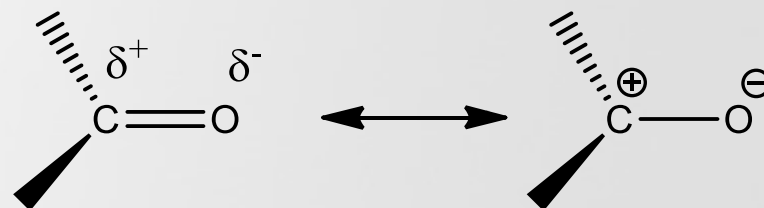
Acetofenona
(1-Feniletanona)



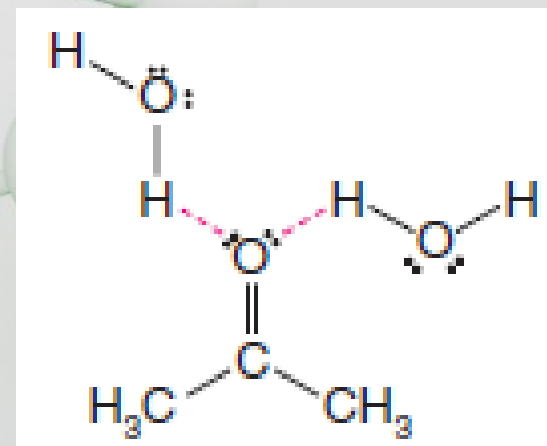
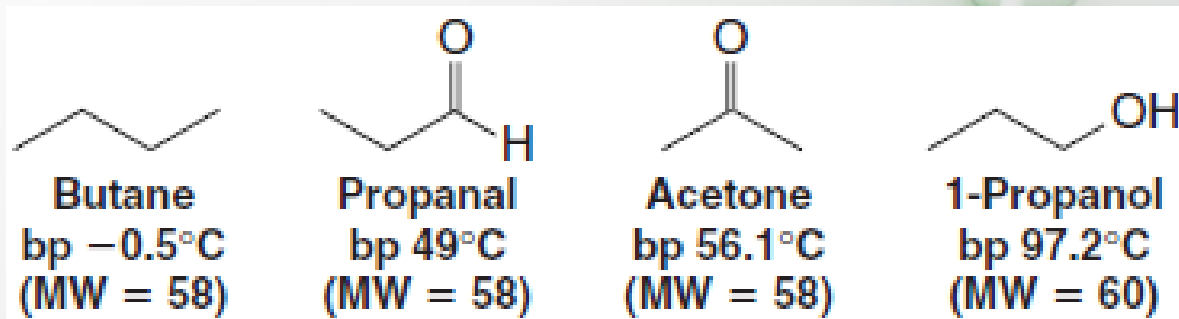
Benzofenona
(Difenilmetanona)

3. Propriedades Físicas

- Devido a diferença de eletronegatividade entre o **C** e o **O**, a ligação dupla é **polarizada**;



- Este fator faz com que as interações intermoleculares sejam do tipo **dipolo-dipolo**, **mais fraca** comparativamente à **ligação de hidrogênio**;



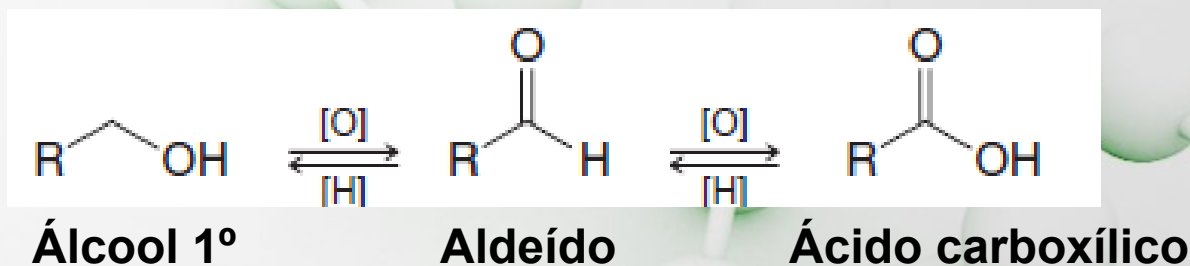
3. Propriedades Físicas

TABLE 16.1 Physical Properties of Aldehydes and Ketones

Formula	Name	mp (°C)	bp (°C)	Solubility in Water
HCHO	Formaldehyde	-92	-21	Very soluble
CH ₃ CHO	Acetaldehyde	-125	21	∞
CH ₃ CH ₂ CHO	Propanal	-81	49	Very soluble
CH ₃ (CH ₂) ₂ CHO	Butanal	-99	76	Soluble
CH ₃ (CH ₂) ₃ CHO	Pentanal	-91.5	102	Slightly soluble
CH ₃ (CH ₂) ₄ CHO	Hexanal	-51	131	Slightly soluble
C ₆ H ₅ CHO	Benzaldehyde	-26	178	Slightly soluble
C ₆ H ₅ CH ₂ CHO	Phenylacetaldehyde	33	193	Slightly soluble
CH ₃ COCH ₃	Acetone	-95	56.1	∞
CH ₃ COCH ₂ CH ₃	Butanone	-86	79.6	Very soluble
CH ₃ COCH ₂ CH ₂ CH ₃	2-Pentanone	-78	102	Soluble
CH ₃ CH ₂ COCH ₂ CH ₃	3-Pentanone	-39	102	Soluble
C ₆ H ₅ COCH ₃	Acetophenone	21	202	Insoluble
C ₆ H ₅ COC ₆ H ₅	Benzophenone	48	306	Insoluble

5.1. Reações de oxidação

- Os **aldeídos** são facilmente oxidados a **ácidos carboxílicos**, mesmo na presença de oxidantes brandos (reagente de Tollens, ácido crômico – H_2CrO_4 , permanganato de potássio – KMnO_4 em meio ácido);



5.2. Redução

- Os aldeídos e cetonas são reduzidos facilmente, respectivamente, a alcoóis primários e secundários, pelo tratamento com boroidreto de sódio:

