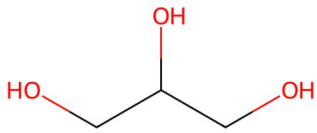
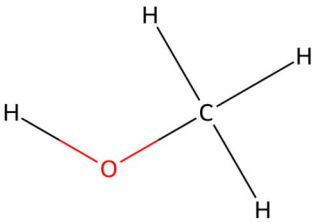
Glycerol
丙三醇
REACTANT



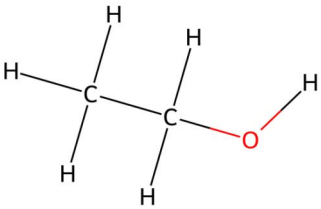
Original Deck

Methanol
甲醇
REACTANT



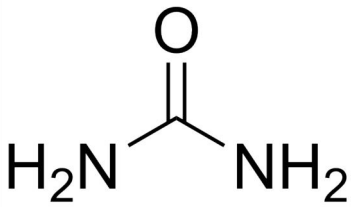
Original Deck

Ethanol
乙醇
REACTANT



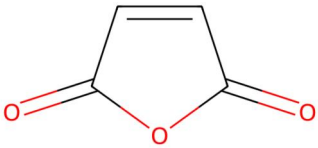
Original Deck

Urea
尿素
REACTANT



Original Deck

Maleic Anhydride
顺丁烯二酸酐
REACTANT

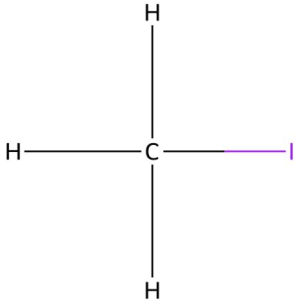


Original Deck

But-1,3-diene
丁二烯
REACTANT

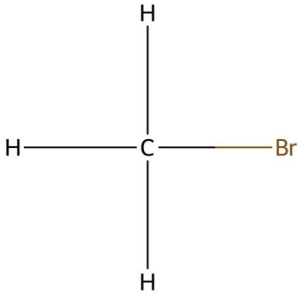
Original Deck

Iodomethane
碘甲烷
REACTANT



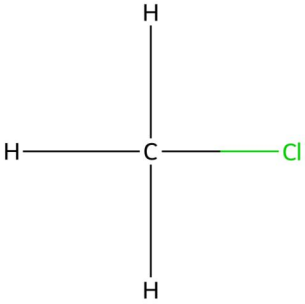
Original Deck

Bromomethane
溴甲烷
REACTANT



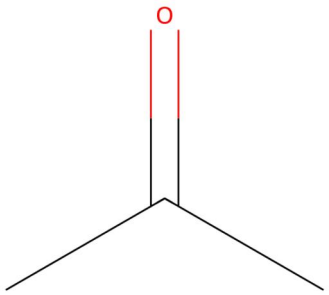
Original Deck

Chloromethane
氯甲烷
REACTANT



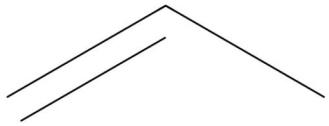
Original Deck

Acetone
丙酮
REACTANT



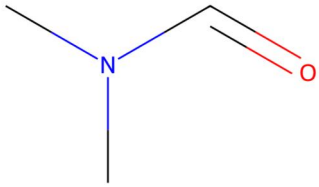
Original Deck

Propene
丙烯
REACTANT



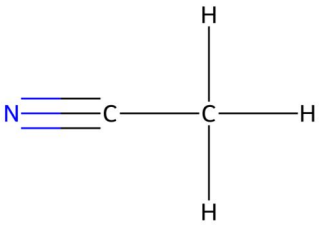
Original Deck

DMF (N,N Dimethyl formamide)
DMF
REACTANT



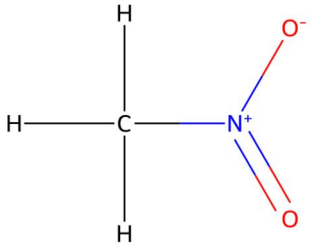
Original Deck

Acetonitrile
乙腈
REACTANT



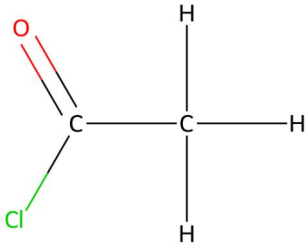
Original Deck

Nitromethane
硝基甲烷
REACTANT



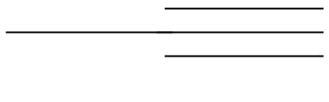
Original Deck

Acetyl chloride
乙酰氯
REACTANT



Original Deck

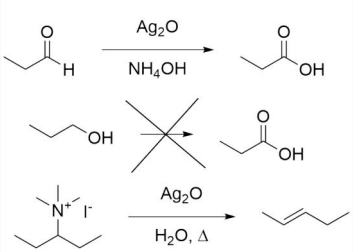
Propyne
丙炔
REACTANT



Original Deck

Ag2O
氧化银
Oxidant

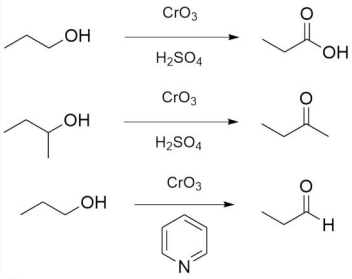
Selective oxidizing agent



Original Deck

CrO3
三氧化铬
Oxidant

Use to prepare Jones/Oxidative agents



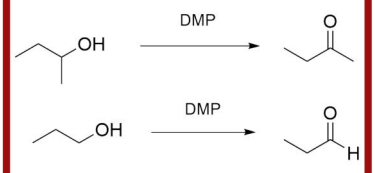
Original Deck

DMP

戴斯-马丁氧化剂

Oxidant

Weak Oxidizing Agent



Original Deck

Oxidant

DMP

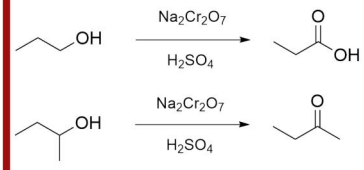
戴斯-马丁氧化剂

H2CrO4

铬酸

Oxidant

Strong Oxidant



Original Deck

Oxidant

H2CrO4

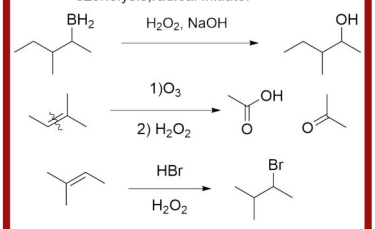
铬酸

H2O2

过氧化氢

Oxidant

Oxidizing agent, hydroboration, ozonolysis,radical initiator



Original Deck

Oxidant

H2O2

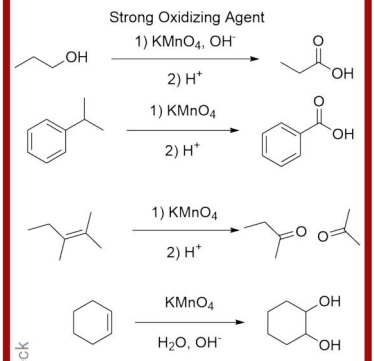
过氧化氢

KMnO4

高锰酸钾

Oxidant

Strong Oxidizing Agent



Original Deck

Oxidant

KMnO4

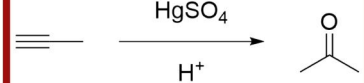
高锰酸钾

HgSO4

硫酸汞

Oxidant

Lewis acid, oxymercuration



Original Deck

Oxidant

HgSO4

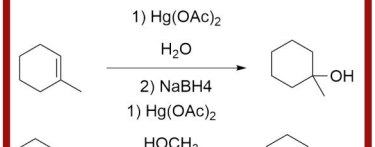
硫酸汞

Hg(OAc)2

醋酸汞

Oxidant

Oxymercuration



Original Deck

Oxidant

Hg(OAc)2

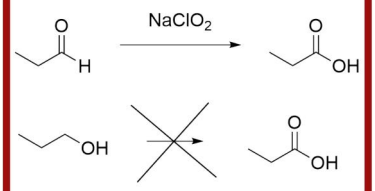
醋酸汞

NaClO2

亚氯酸钠

Oxidant

Selective oxidizing agent



Original Deck

Oxidant

NaClO2

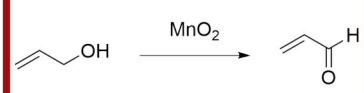
亚氯酸钠

MnO2

二氧化锰

Oxidant

Weak oxidizing agent



Original Deck

Oxidant

MnO2

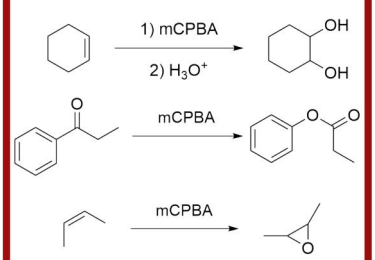
二氧化锰

mCPBA

间氯过氧苯甲酸

Oxidant

Oxidizing agent, Epoxidation, Baeyer-Villiger



Original Deck

Oxidant

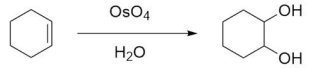
mCPBA

间氯过氧苯甲酸

OsO_4

四氧化锇

Oxidant



Note: In reality you would need $NaHSO_3$ to finish the reaction but in this case it wouldn't be included into the reaction.

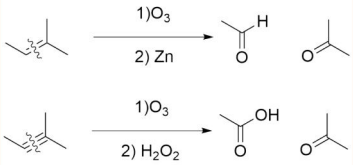
Original Deck

O_3

臭氧

Oxidant

Oxidizing Agent for Ozonolysis



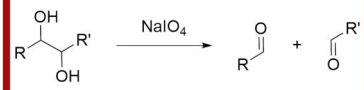
Original Deck

$NaIO_4$

高碘酸钠

Oxidant

Strong Oxidizing Agent

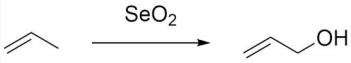


Original Deck

SeO_2

二氧化硒

Oxidant



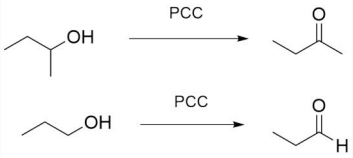
Original Deck

PCC

吡啶氯铬酸盐

Oxidant

Weak Oxidizing Agent



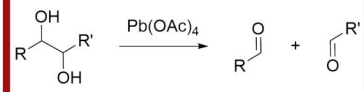
Original Deck

$Pb(OAc)_4$

乙酸铅(IV)

Oxidant

Strong Oxidizing Agent



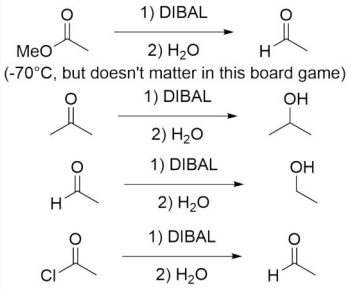
Original Deck

DIBAL

氢化二异丁基铝溶液

REDUCTANT

Weak oxidizing agent



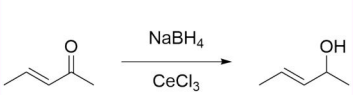
Original Deck

$CeCl_3$

氯化铈

REDUCTANT

Selective reduction of carbonyl in α, β unsaturated carbonyl



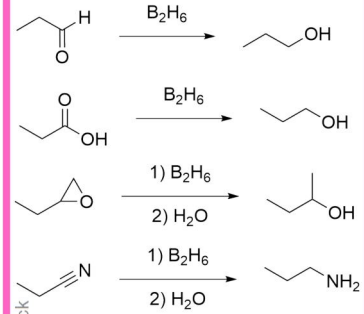
Original Deck

B_2H_6

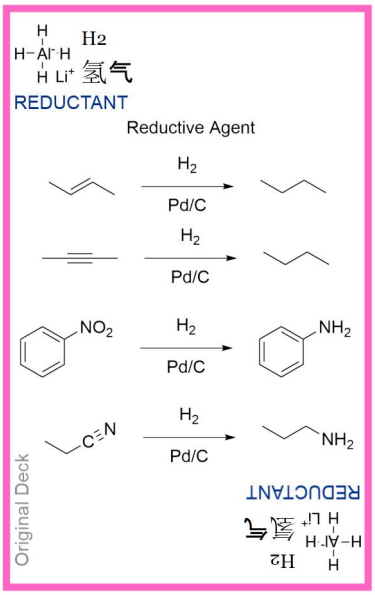
硼烷

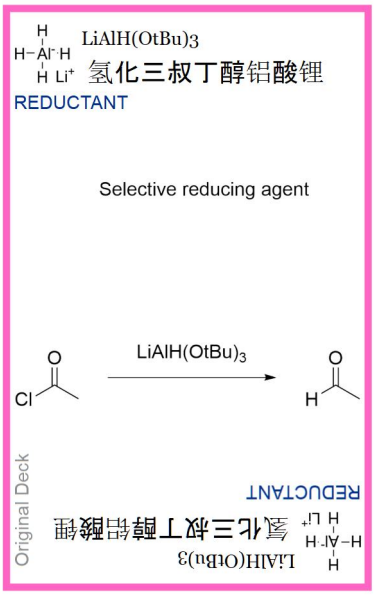
REDUCTANT

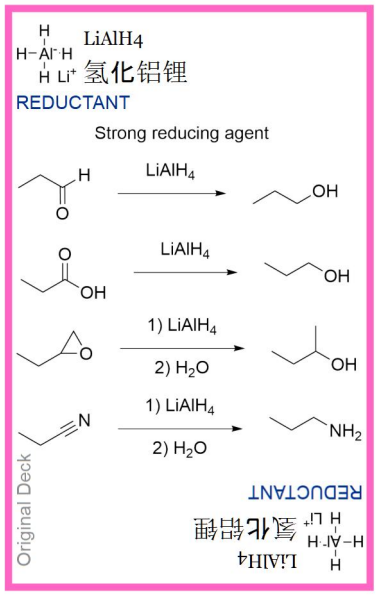
Strong reducing agent

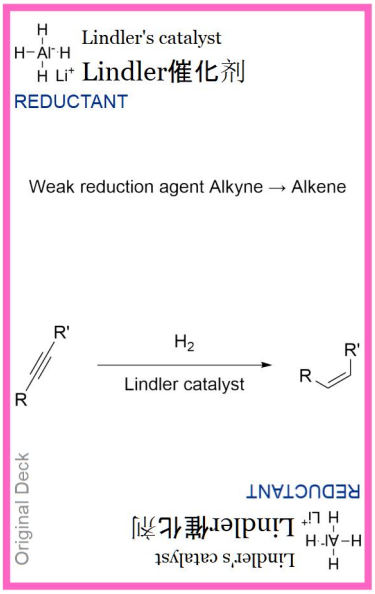


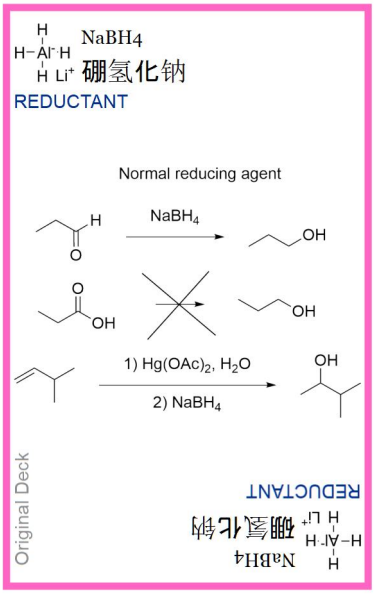
Original Deck

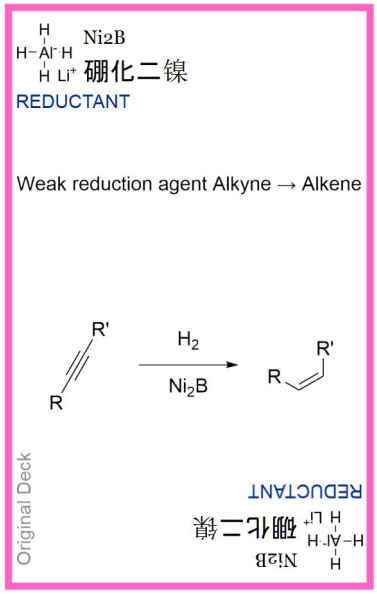

H2
氢气
REDUCTANT
Reductive Agent
H2
Pd/C
NO2
NH2
N
Original Deck

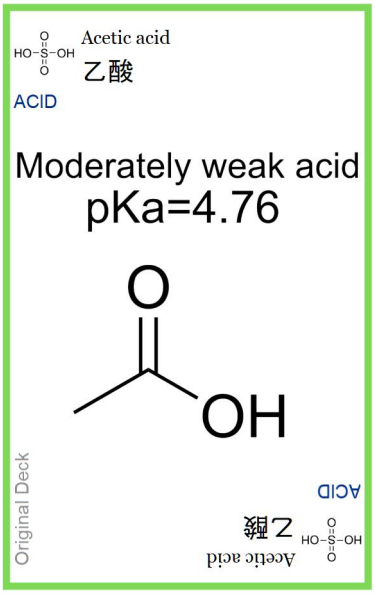

LiAlH(OtBu)3
氢化三叔丁醇铝酸锂
REDUCTANT
Selective reducing agent
LiAlH(OtBu)3
Cl
H
Original Deck

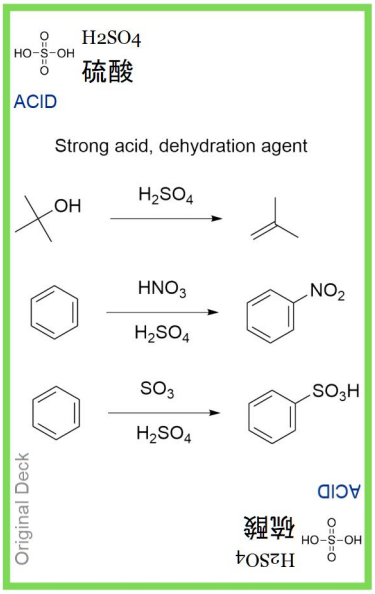

LiAlH4
氢化铝锂
REDUCTANT
Strong reducing agent
LiAlH4
OH
1) LiAlH4
2) H2O
NH2
N
Original Deck

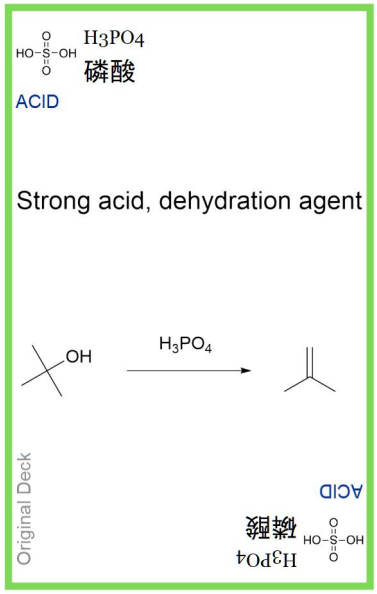

Lindler's catalyst
Lindler催化剂
REDUCTANT
Weak reduction agent Alkyne → Alkene
H2
Lindler catalyst
R'
R
Original Deck


NaBH4
硼氢化钠
REDUCTANT
Normal reducing agent
NaBH4
OH
1) Hg(OAc)2, H2O
2) NaBH4
Original Deck


Ni2B
硼化二镍
REDUCTANT
Weak reduction agent Alkyne → Alkene
H2
Ni2B
R'
R
Original Deck


Acetic acid
乙酸
ACID
Moderately weak acid
pKa=4.76
O
OH
Original Deck


H2SO4
硫酸
ACID
Strong acid, dehydration agent
OH
H2SO4
HNO3
NO2
SO3
SO3H
Original Deck

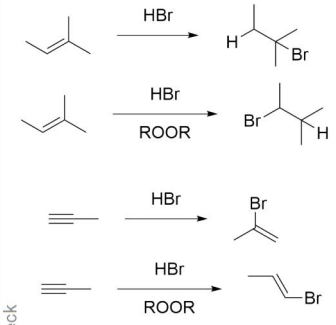

H3PO4
磷酸
ACID
Strong acid, dehydration agent
OH
H3PO4
Original Deck

HBr

氢溴酸

ACID

Strong acid



Original Deck

ACID

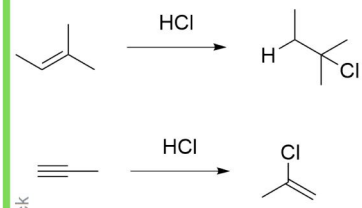
HBr 氢溴酸

HCl

盐酸/氯化氢

ACID

Strong acid



Original Deck

ACID

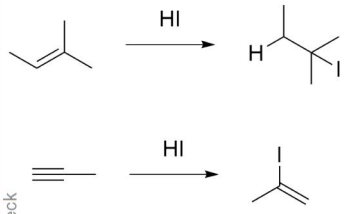
HCl 盐酸/氯化氢

HI

氢碘酸

ACID

Strong acid



Original Deck

ACID

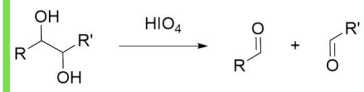
HI 氢碘酸

HIO_4

高碘酸

ACID

Strong Oxidizing Agent



Original Deck

ACID

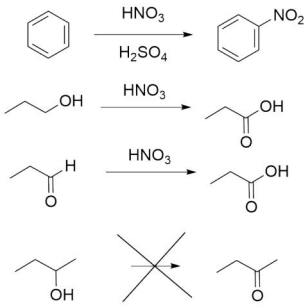
HIO_4 高碘酸

HNO_3

硝酸

ACID

Strong acid, Oxidizing agent



Original Deck

ACID

HNO_3 硝酸

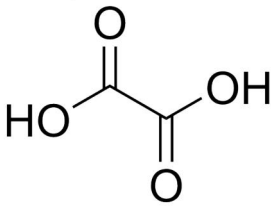
Oxalic acid

草酸

ACID

Reducing agent or it can be used as reactant, strong acid

pKa=1.27



Original Deck

ACID

Oxalic acid 草酸

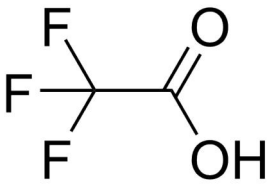
TFA

三氟乙酸

ACID

Strong acid

pKa=0.52



Original Deck

ACID

TFA 三氟乙酸

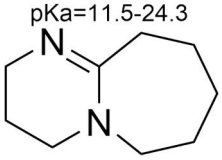
DBU

DBU

BASE

Base, amination dehydrogenation, etc.

pKa=11.5-24.3



There are way too many stuff about DBU. Here is a paper: https://www.tandfonline.com/doi/full/10.1080/17518253.2022.2132836#d1e350a

Original Deck

BASE

DBU

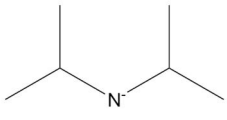
LDA

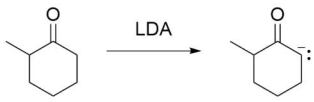
二异丙基氨基锂

BASE

Very strong sterically hindered base

pKa=36





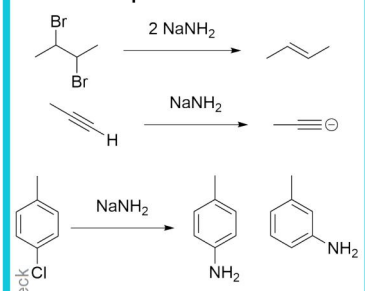
Original Deck

BASE

LDA 二异丙基氨基锂

NaNH2
氨基钠
BASE

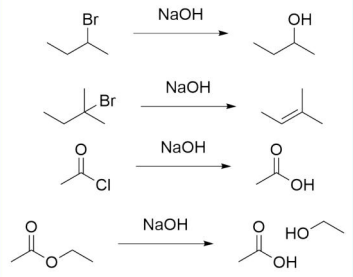
Strong base
pKa=38



Original Deck
BASE
NaNH2
氨基钠

NaOH
氢氧化钠
BASE

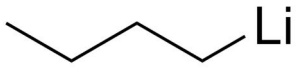
Common base, nucleophile, elimination reagent



Original Deck
BASE
NaOH
氢氧化钠

n-BuLi
正丁基锂
BASE

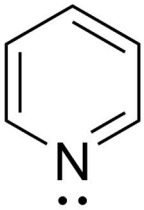
Very strong base
pKa=50



Original Deck
BASE
n-BuLi
正丁基锂

Pyridine
吡啶
BASE

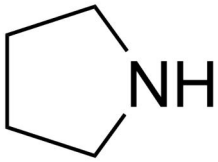
Base
pKa = 5.25



Original Deck
BASE
Pyridine
吡啶

Pyrrolidine
四氢吡咯
BASE

Strong base
pKa=11.2



Original Deck
BASE
Pyrrolidine
四氢吡咯

NaH
氢化钠
BASE

Strong base
pKa = 35

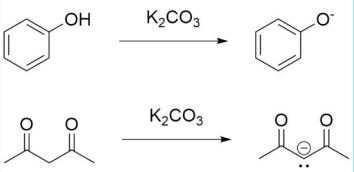
H−Na

Original Deck
BASE
NaH
氢化钠

K2CO3
碳酸钾
BASE

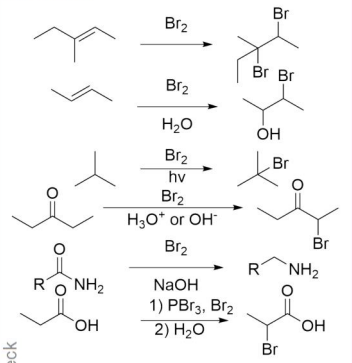
Weak Base

pKa = 10.25



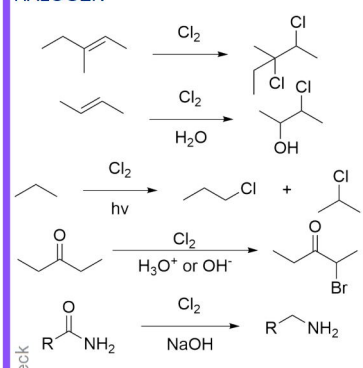
Original Deck
BASE
K2CO3
碳酸钾

Br−Br Br2
溴
HALOGEN



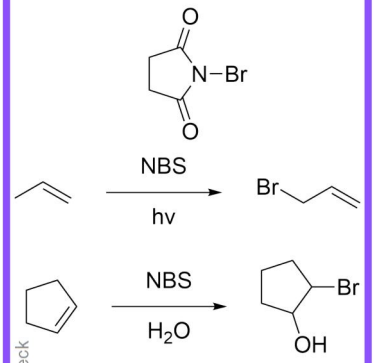
Original Deck
HALOGEN
Br2
Br−Br 溴

Br−Br Cl2
氯
HALOGEN



Original Deck
HALOGEN
Cl2
Br−Br 氯

Br−Br NBS
NBS
HALOGEN



Original Deck

Br−Br NBS
NBS
HALOGEN

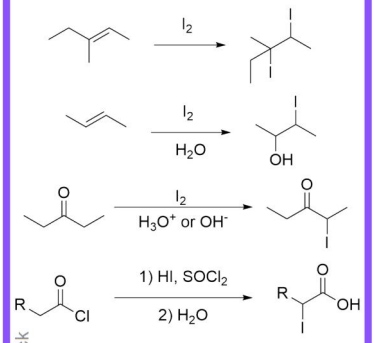
Br−Br KI
碘化钾
HALOGEN

Weak reducing agent, source of iodine

Original Deck

Br−Br KI
碘化钾
HALOGEN

Br−Br I2
碘
HALOGEN

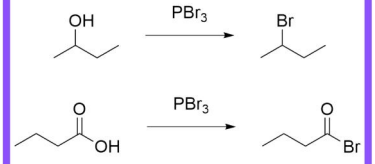


Original Deck

Br−Br I2
碘
HALOGEN

Br−Br PBr3
三溴化磷
HALOGEN

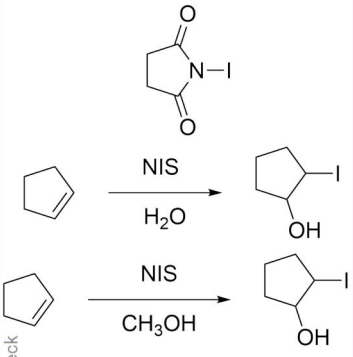
OH → Br



Original Deck

Br−Br PBr3
三溴化磷
HALOGEN

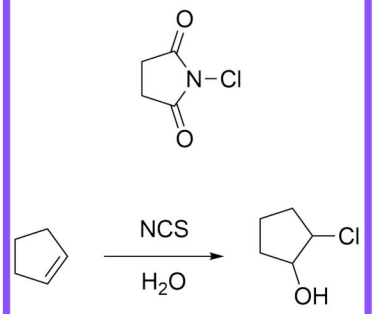
Br−Br NIS
NIS
HALOGEN



Original Deck

Br−Br NIS
NIS
HALOGEN

Br−Br NCS
NCS
HALOGEN

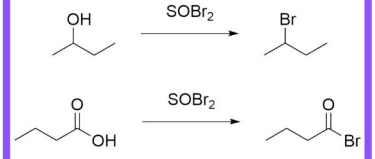


Original Deck

Br−Br NCS
NCS
HALOGEN

Br−Br SOBr2
亚硫酰溴
HALOGEN

OH → Br

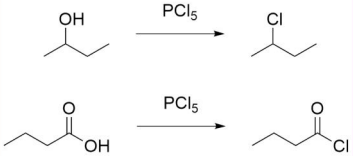


Original Deck

Br−Br SOBr2
亚硫酰溴
HALOGEN

Br−Br PCl5
五氯化磷
HALOGEN

OH → Cl

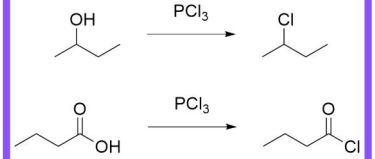


Original Deck

Br−Br PCl5
五氯化磷
HALOGEN

Br−Br PCl3
三氯化磷
HALOGEN

OH → Cl

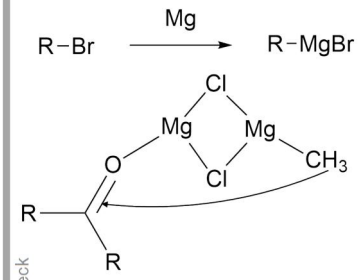


Original Deck

Br−Br PCl3
三氯化磷
HALOGEN

Mg
镁
METALS & YLID

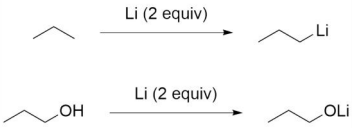
Grignard Reaction



Original Deck

Li
锂
METALS & YLID

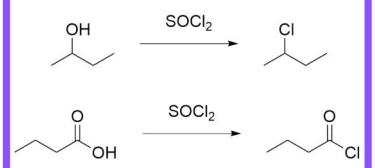
Reducing agent



Original Deck

$SOCl_2$
亚硫酰氯
$Br-Br$
HALOGEN

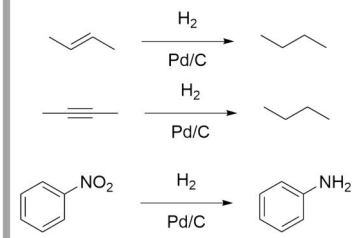
OH → Cl



Original Deck

Pd/C
钯/碳
METALS & YLID

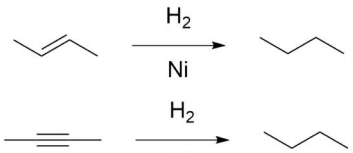
Reductive Agent



Original Deck

Ni
镍
METALS & YLID

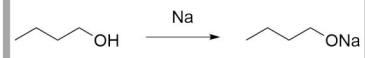
Reducing agent



Original Deck

Na
钠
METALS & YLID

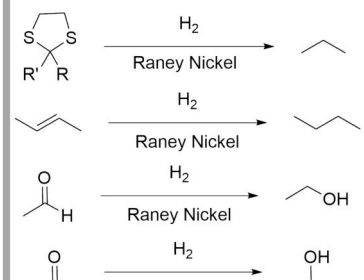
Reducing Agent, reactive metal



Original Deck

Ra-Ni
Raney镍
METALS & YLID

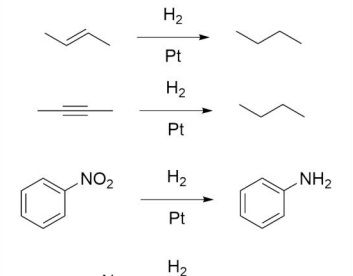
Reducing agent/remove protecting group



Original Deck

Pt
铂
METALS & YLID

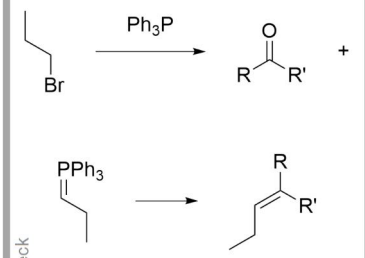
Reductive Agent



Original Deck

PPh3
三苯基磷
METALS & YLID

Wittig Reaction



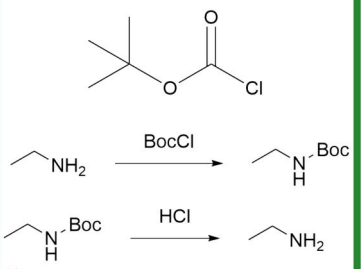
Original Deck

BocCl

Boc-Cl

PROT & LEAV G

Amine protecting group



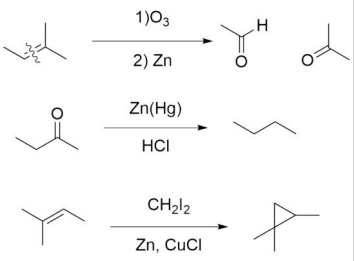
Original Deck

Zn (Or any Zn alloy)

锌 (或任何锌合金)

METALS & YLID

Reducing agent

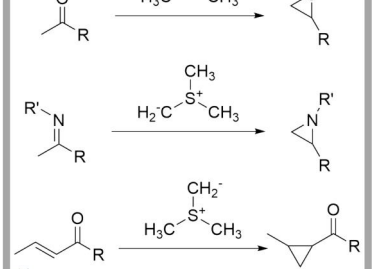


Original Deck

Sulfur ylide

硫叶立德(锍叶立德)

METALS & YLID



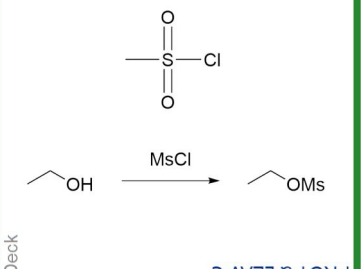
Original Deck

MsCl

甲烷磺酰氯

PROT & LEAV G

Better alcohol leaving group



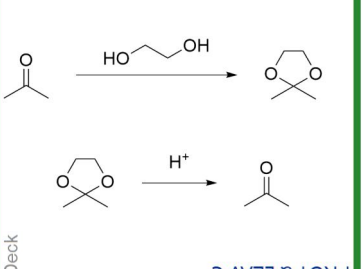
Original Deck

Ethylene glycol

乙二醇

PROT & LEAV G

Carbonyl protecting group



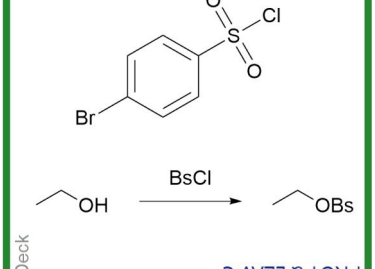
Original Deck

BsCl

3-溴苯磺酰氯

PROT & LEAV G

Better alcohol leaving group



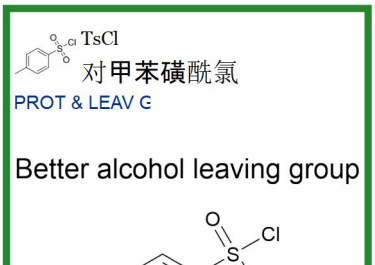
Original Deck

TsCl

对甲苯磺酰氯

PROT & LEAV G

Better alcohol leaving group



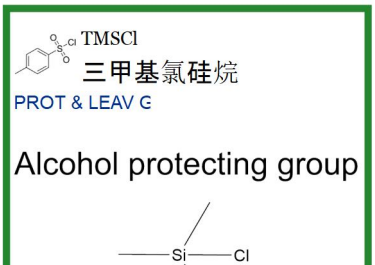
Original Deck

TMSCl

三甲基氯硅烷

PROT & LEAV G

Alcohol protecting group



Original Deck

NaN3

叠氮化钠

PROT & LEAV G

Good leaving group + Curtius rearrangment

Original Deck

hv

光照

RXN COND & H

ATOMIC STRUCTURE

$$E = h\nu$$

$$c = \lambda\nu$$

$$F_{coulombic} \propto \frac{q_1 q_2}{r^2}$$

E = energy
ν = frequency
λ = wavelength
F = force
q = charge
r = separation

Planck's constant, $h = 6.626 \times 10^{-34}$ J s

Speed of light, $c = 2.998 \times 10^{8}$ m s^{-1}

Avogadro's number = 6.022×10^{23} mol^{-1}

Original Deck

hv 光照 RXN COND & H Original Deck

H_2O

水

RXN COND & H

Original Deck

H_2O 水 RXN COND & H Original Deck

Δ

加热

RXN COND & H

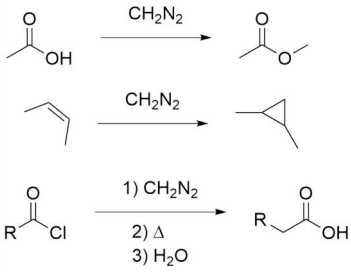
Original Deck

Δ 加热 RXN COND & H Original Deck

CH_2N_2

重氮甲烷

OTHER



Original Deck

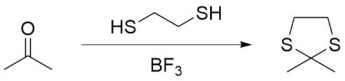
CH_2N_2 重氮甲烷 OTHER Original Deck

BF_3

三氟化硼

OTHER

Strong lewis acid



Original Deck

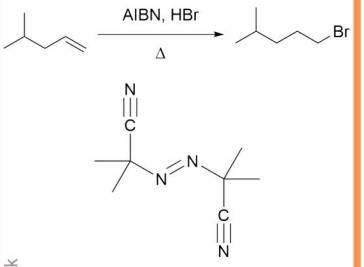
BF_3 三氟化硼 OTHER Original Deck

AIBN

偶氮二异丁腈

RXN COND & H

Radical initiator



Original Deck

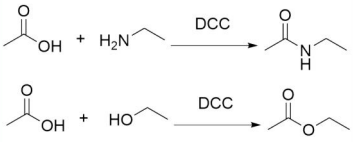
AIBN 偶氮二异丁腈 RXN COND & H Original Deck

DCC

二环己基碳二亚胺

OTHER

Dehydration agent



Original Deck

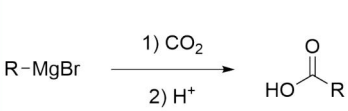
DCC 二环己基碳二亚胺 OTHER Original Deck

CO_2

二氧化碳

OTHER

Adding COOH



Original Deck

CO_2 二氧化碳 OTHER Original Deck

CO

一氧化碳

OTHER

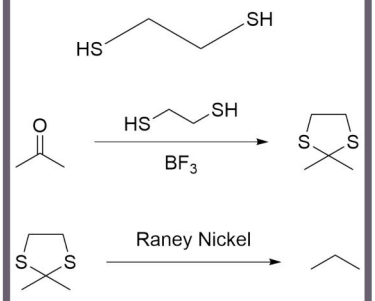
Original Deck

CO 一氧化碳 OTHER Original Deck

EDT

1,2-乙二硫醇

OTHER



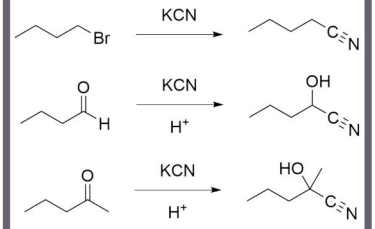
Original Deck

KCN

氰化钾

OTHER

Good Nucleophile



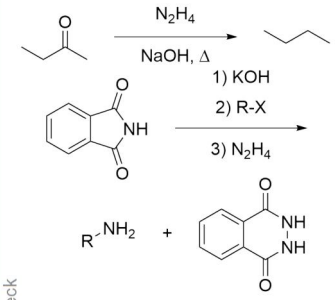
Original Deck

N2H4

肼

OTHER

Good nucleophile, reducing agent, Wolff-Kishner, Gabriel Synthesis



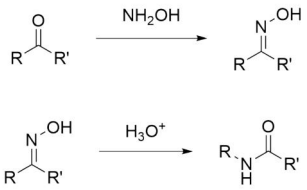
Original Deck

NH2OH

羟胺

OTHER

Good nucleophile, Beckmann rearrangement



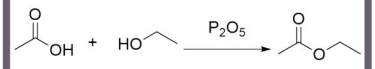
Original Deck

P2O5

五氧化二磷

OTHER

Dehydration agent



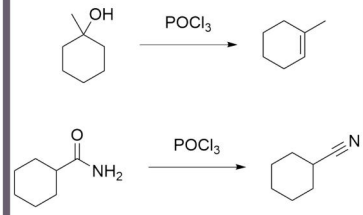
Original Deck

POCl3

三氯氧化磷

OTHER

Dehydration reagent



Original Deck

WILD CARD

万能牌

Premium

Original Deck

DUPLICATION CARD

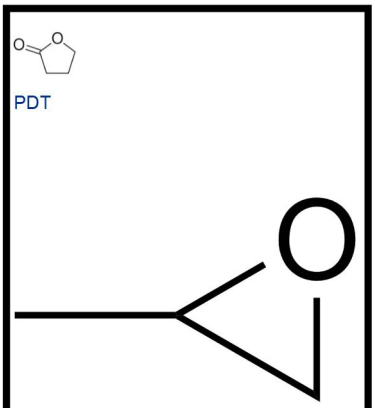
复制牌

Premium

CTRL +C

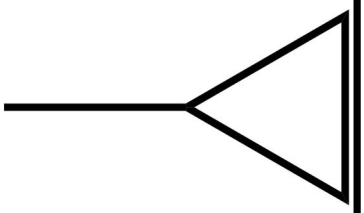
Original Deck

PDT



Original Deck

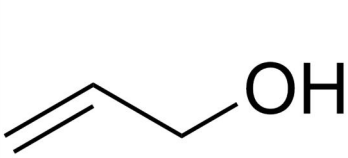
PDT



Original Deck

PDT

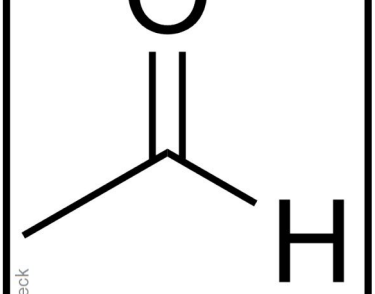
PDT



Original Deck

PDT

PDT



Original Deck

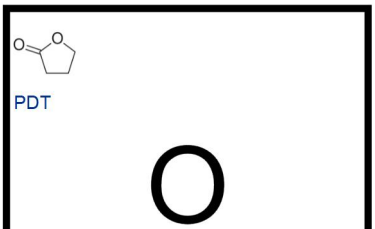
PDT

PDT

Original Deck

PDT

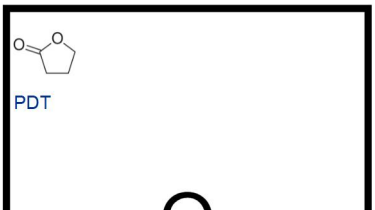
PDT



Original Deck

PDT

PDT



Original Deck

PDT

PDT

Original Deck

PDT

PDT

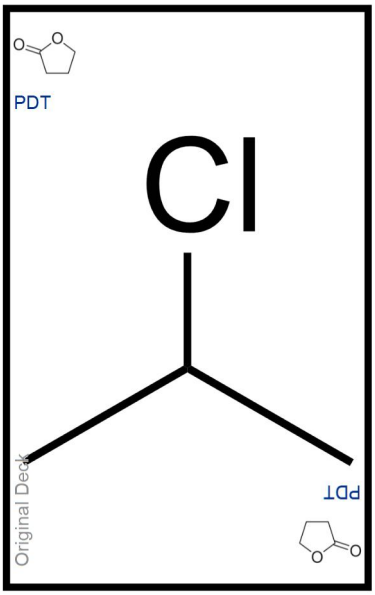
Original Deck

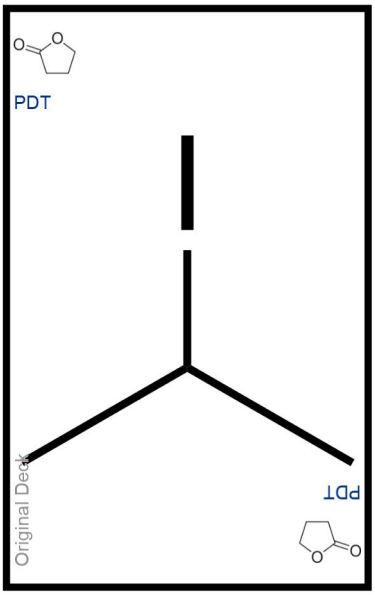
PDT

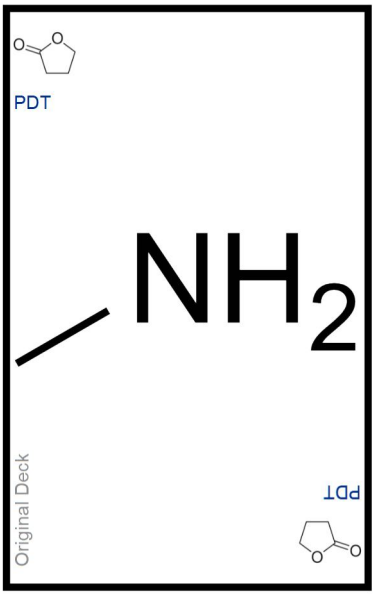
PDT

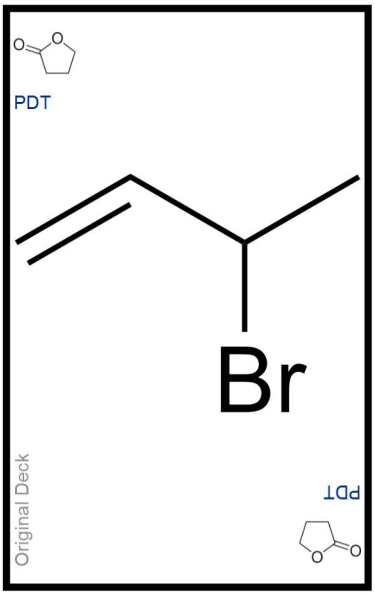
Original Deck

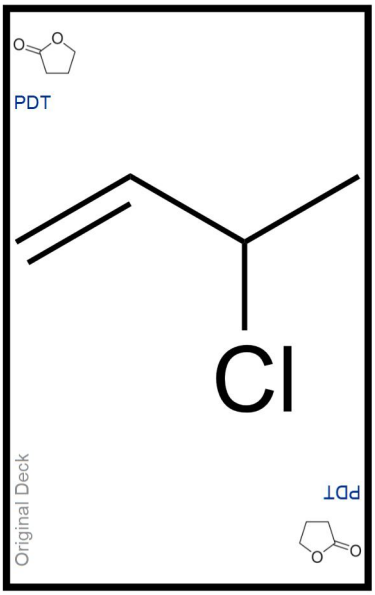
PDT

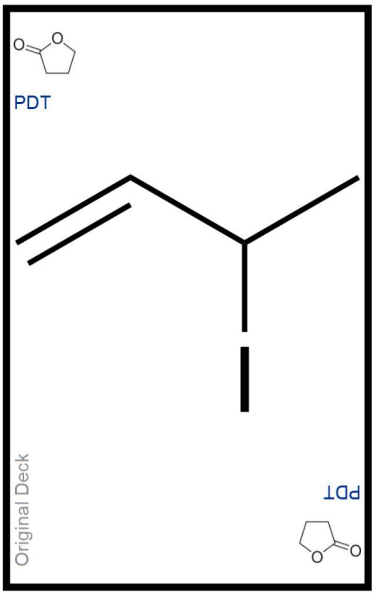

PDT
Cl
Original Deck
PDT

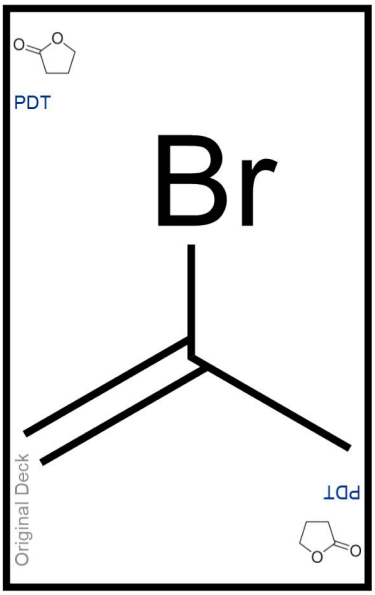

PDT
I
Original Deck
PDT

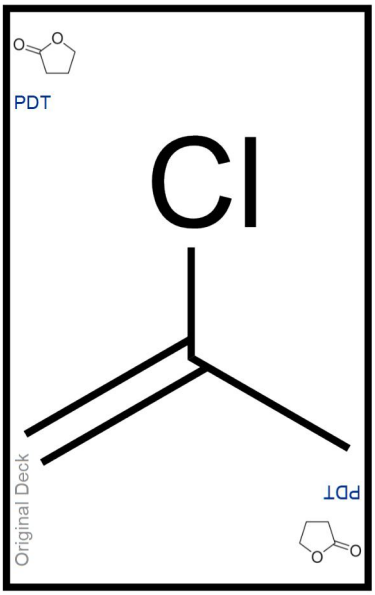

PDT
NH2
Original Deck
PDT

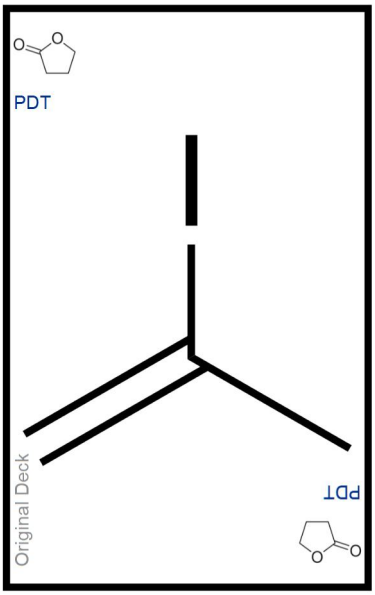

PDT
Br
Original Deck
PDT

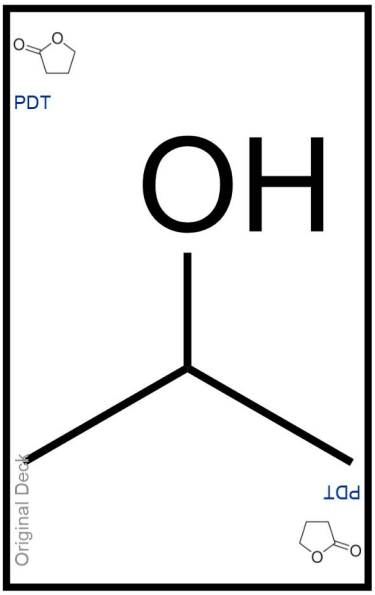

PDT
Cl
Original Deck
PDT

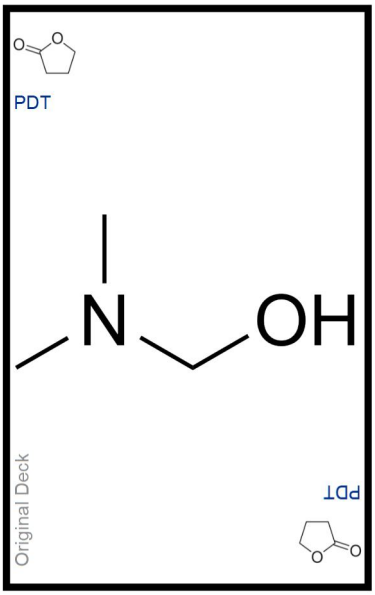

PDT
I
Original Deck
PDT

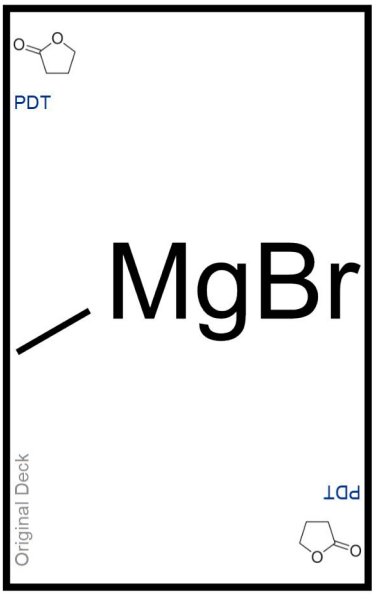

PDT
Br
Original Deck
PDT

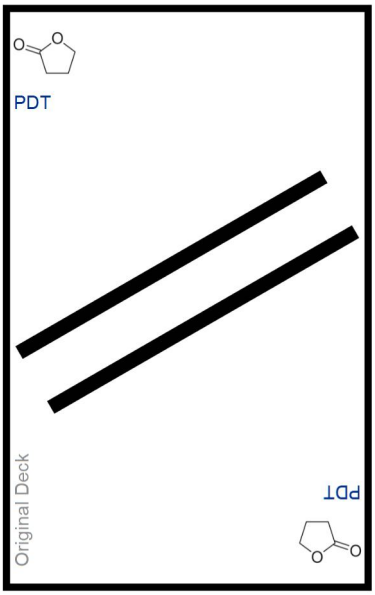

PDT
Cl
Original Deck
PDT

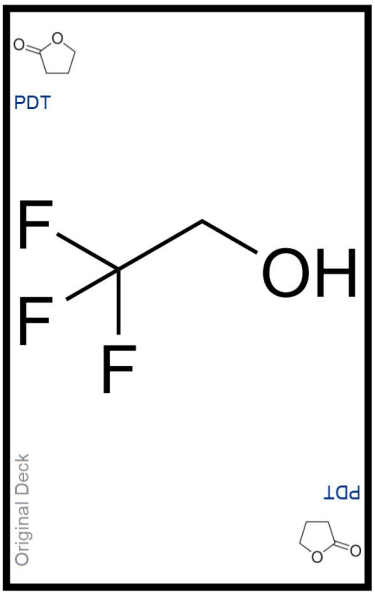

PDT
I
Original Deck
PDT

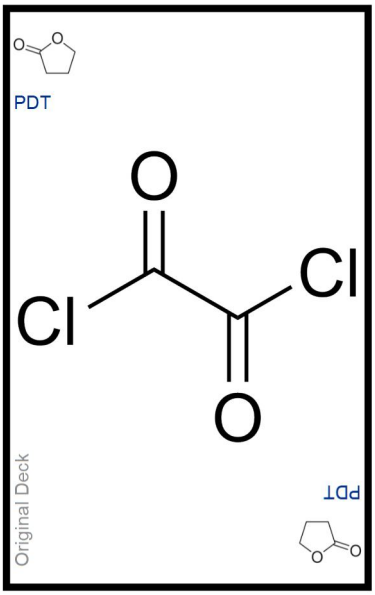

PDT
OH
Original Deck
PDT

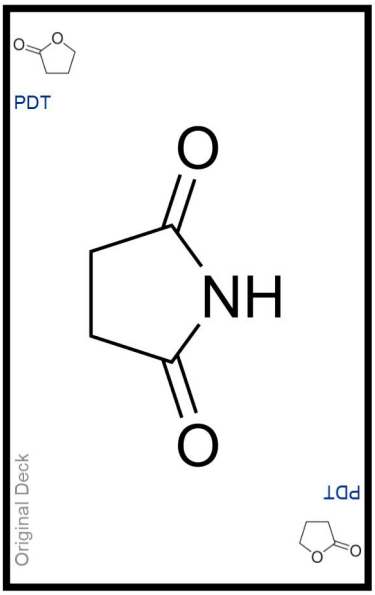

PDT
N
OH
Original Deck
PDT

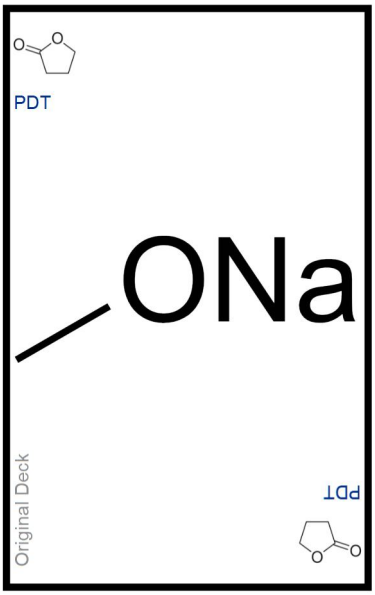

PDT
MgBr
Original Deck
PDT

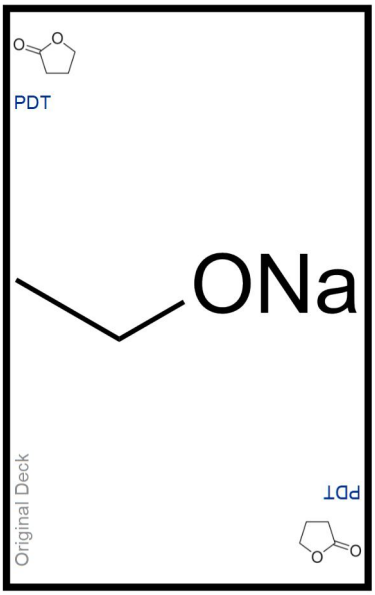

PDT
Original Deck
PDT


PDT
F
F
F
OH
Original Deck
PDT

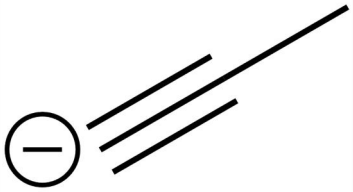

PDT
O
Cl
Cl
O
Original Deck
PDT


PDT
O
NH
O
Original Deck
PDT


PDT
ONa
Original Deck
PDT


PDT
ONa
Original Deck
PDT

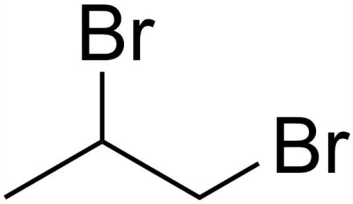
PDT



Original Deck

PDT

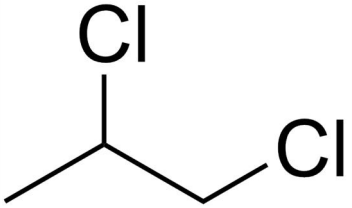
PDT



Original Deck

PDT

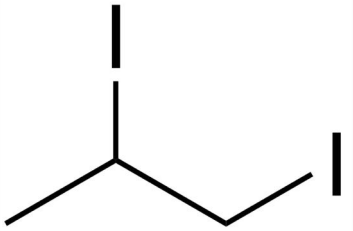
PDT



Original Deck

PDT

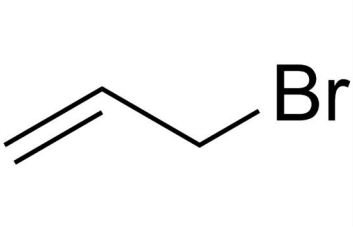
PDT



Original Deck

PDT

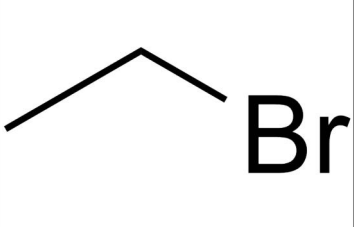
PDT



Original Deck

PDT

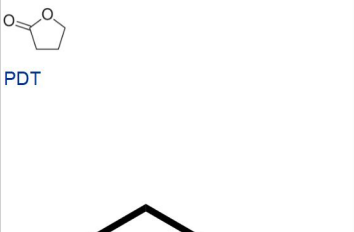
PDT



Original Deck

PDT

PDT



Original Deck

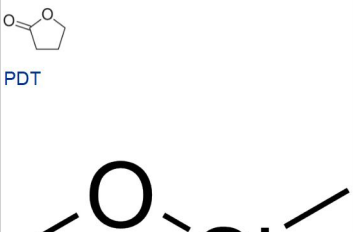
PDT

PDT

Original Deck

PDT

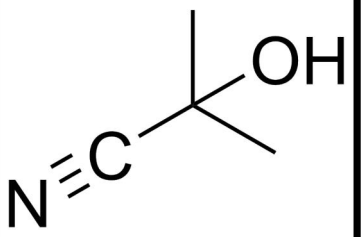
PDT



Original Deck

PDT

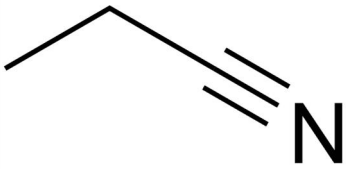
PDT



Original Deck

PDT

PDT



Original Deck

PDT

PDT

Original Deck

PDT

PDT

Original Deck

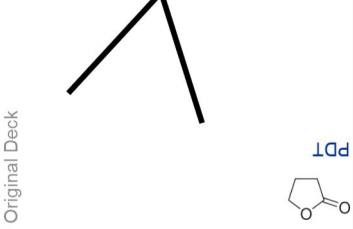
PDT

PDT

Original Deck

PDT

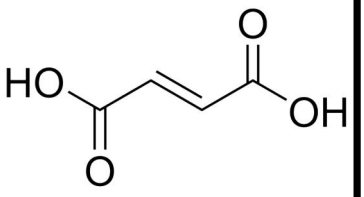
PDT



Original Deck

PDT

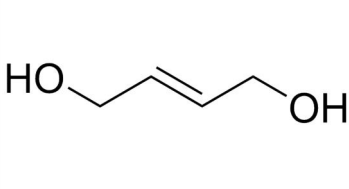
PDT



Original Deck

PDT

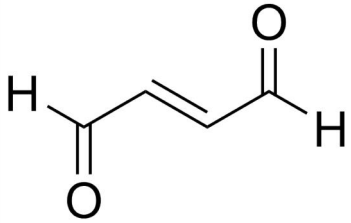
PDT



Original Deck

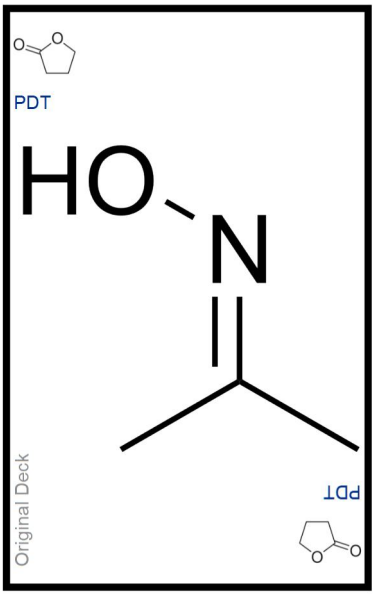
PDT

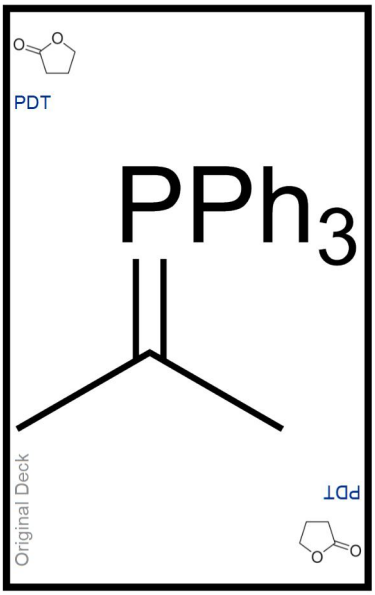
PDT

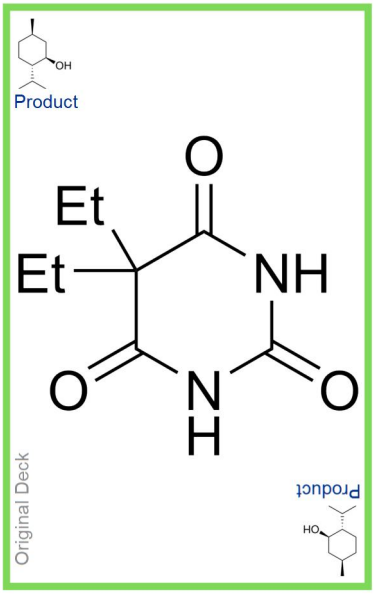


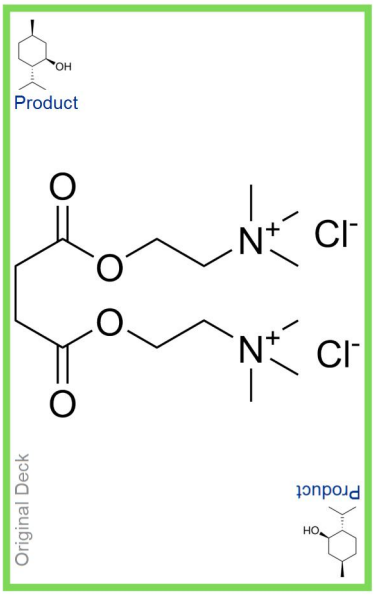
Original Deck

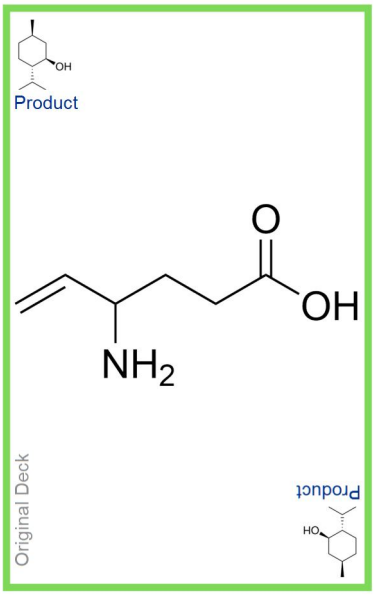
PDT

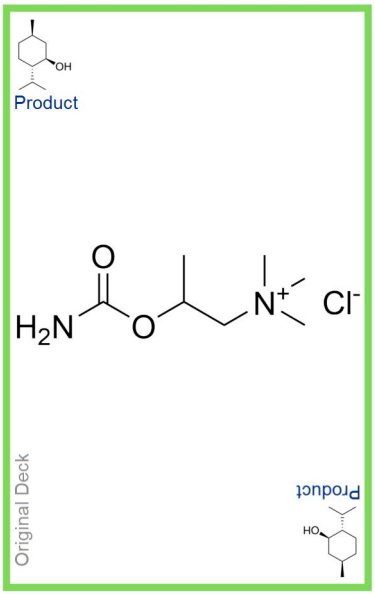

PDT
HO
N
Original Deck
PDT

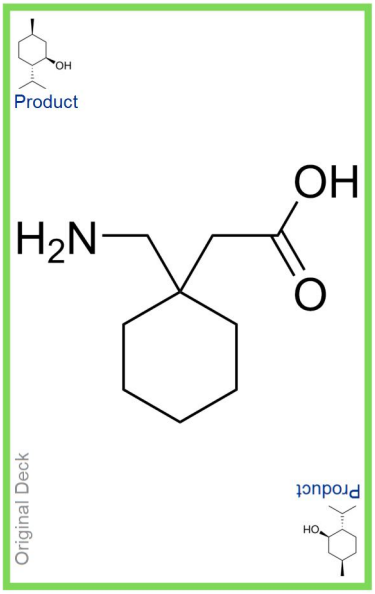

PDT
PPh3
Original Deck
PDT

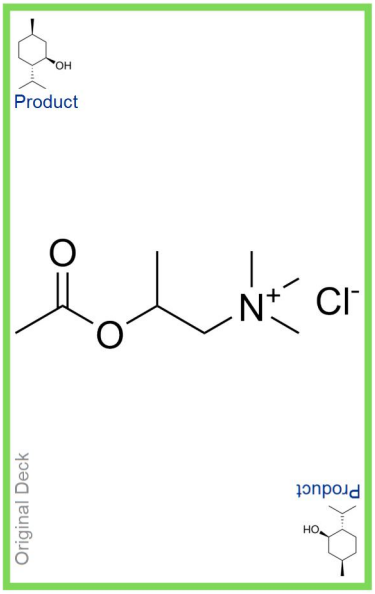

Product
OH
O
Et
Et
NH
O
N
H
O
Original Deck
Product
HO

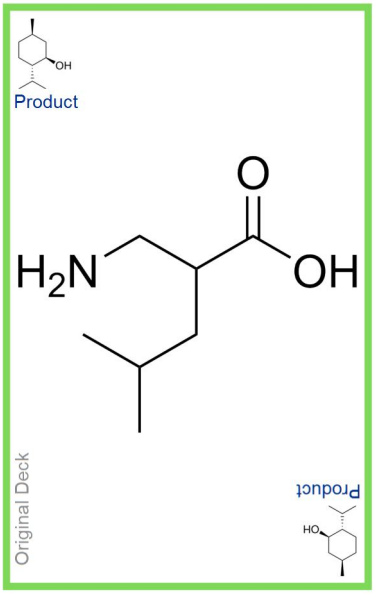

Product
Original Deck
Product

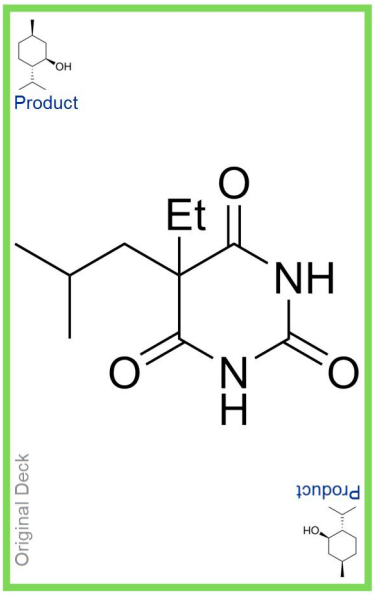

Product
Original Deck
Product

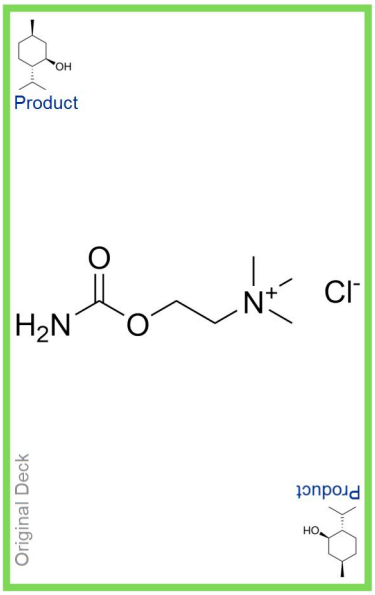

Product
Original Deck
Product

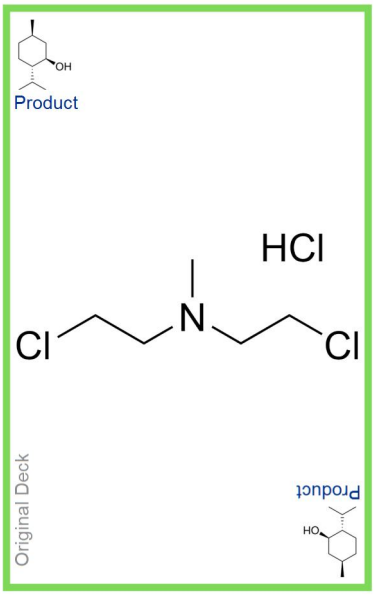

Product
Original Deck
Product

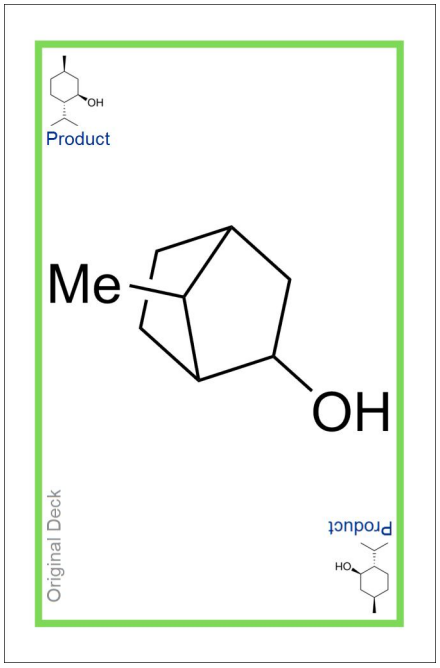

Product
Original Deck
Product

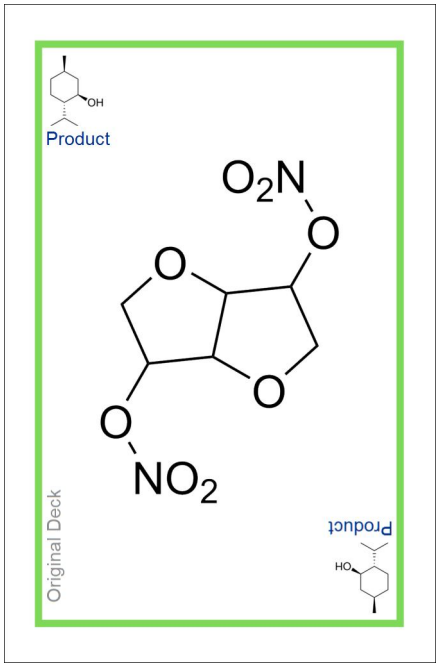

Product
Original Deck
Product

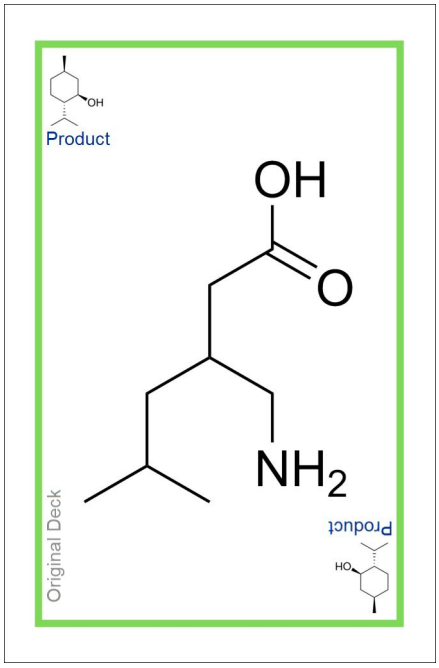

Product
Original Deck
Product


Product
Original Deck
Product


Product
Original Deck
Product


Product
Me
OH
Original Deck
Product


Product
O_2N
O
O
O
O
NO_2
Original Deck
Product


Product
OH
O
NH_2
Original Deck
Product