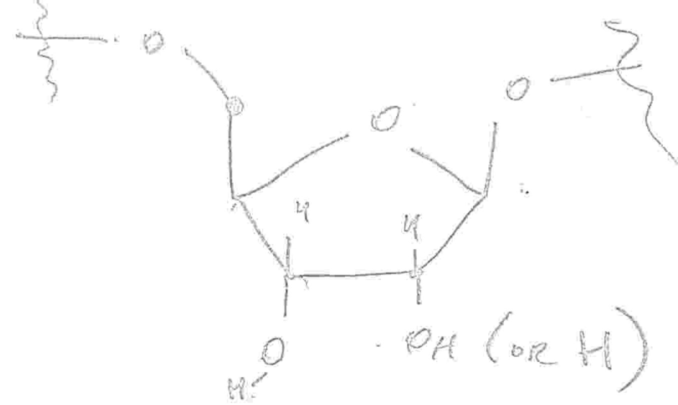
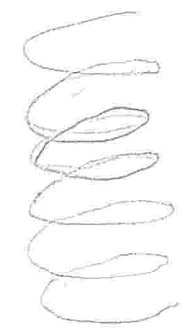
CHM151:

2016/10/03

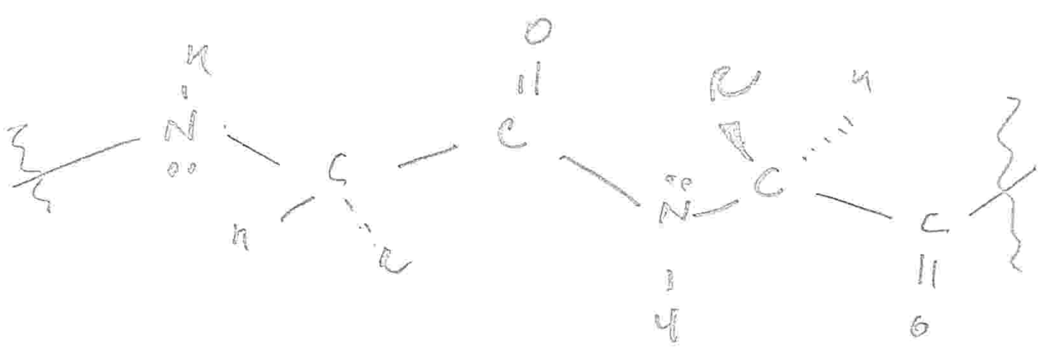
CHIRALITY IN NATURE

DNA

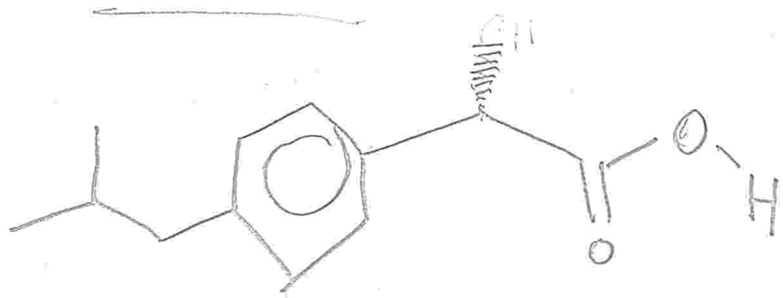




PROTEINS

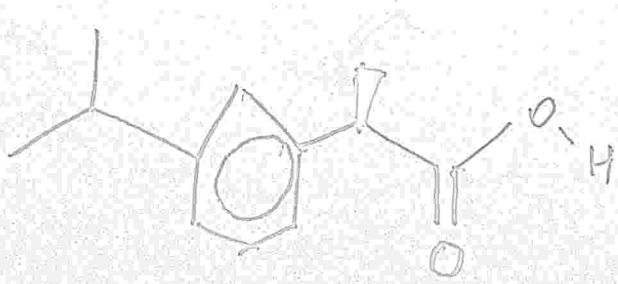


NSAIDS



S- IBUPROFEN

INACTIVE ENANTIOMER



R- IBUPROFEN

ENANTIOSELECTIVE (ASSYMETRIC) CATALYSIS

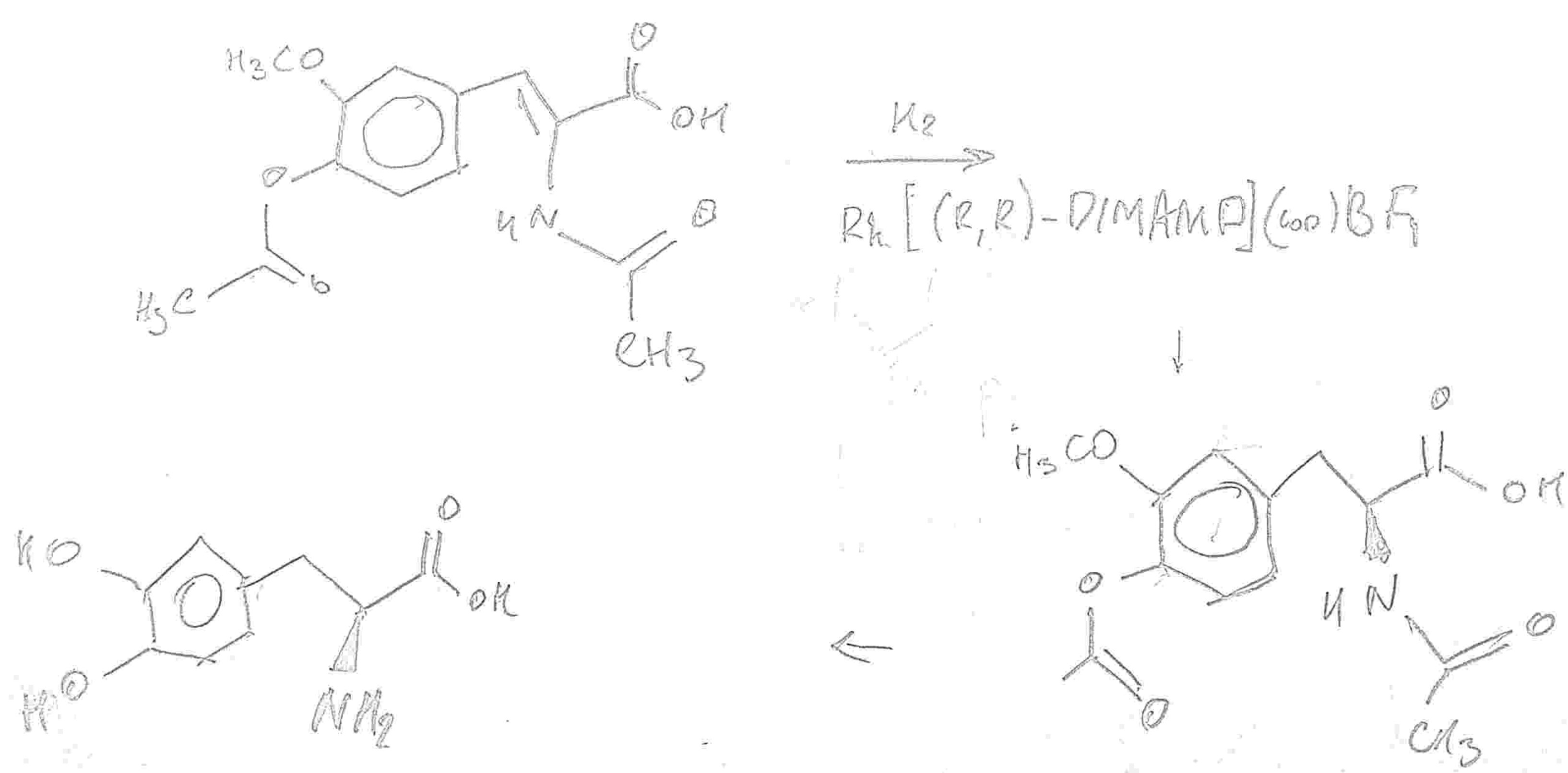
THE USE OF A CHIRAL CATALYST CAN RESULT IN THE SELECTIVE FORMATION OF ONE ENANTIOMERIC PRODUCT OF A CHEMICAL REACTION.

ENZYMES (BUILT FROM CHIRAL AMINO ACIDS) ARE NATURAL CATALYSTS FOR ENANTIOSELECTIVE REACTIONS.

ENANTIOMERIC EXCESS (e.e.):

FOR A MIXTURE OF (+) AND (−) ENANTIOMERS CONSISTING OF x % (+) AND y % (−) THE PERCENT ENANTIOMERIC EXCESS (% e.e) IS x−y.

RACEMATE 0% = ee



→ CRIXWAN (INDINAVIR) AS ONE OF THREE DRUGS TARGETING AIDS, OBTAINED VIA WITH THE METAL ASSYMETRIC CATALYSTS

STRUCTURE AND BONDING IN ORGANIC MOLECULES

POLAR COVALENT BONDING

WHAT DETERMINES BOND POLARITY?

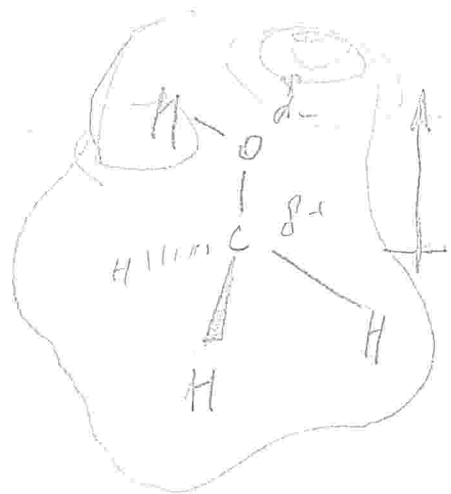
→ DIFFERENCES IN THE ELECTRONEGATIVITY.

$\left|\{\Delta EN\}\right| > 2$ :: LARGELY IONIC BOND

$\{\delta EN\}_C = 2.5 \Rightarrow$ C FORMS COVALENT BONDS WITH VIRTUALLY ALL ELEMENTS.

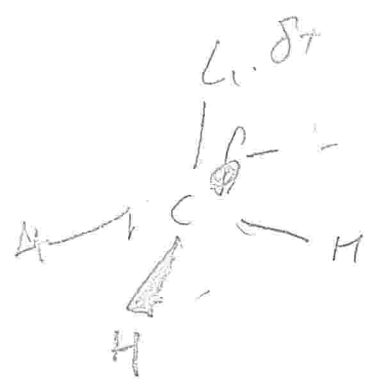
EXAMPLES

(a) METHANOL



OXYGEN: EN = 3.5
CARBON: EN = 2.5

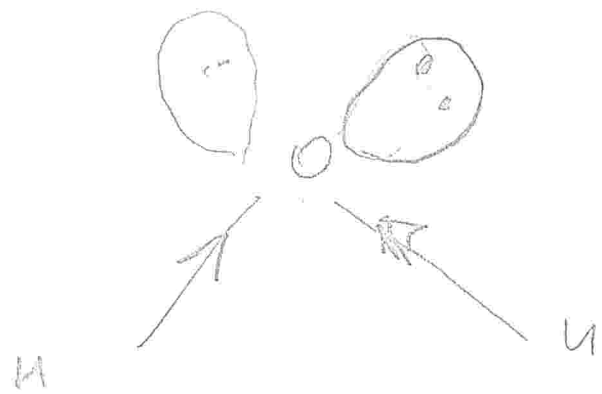
(b) METHYLLITHIUM

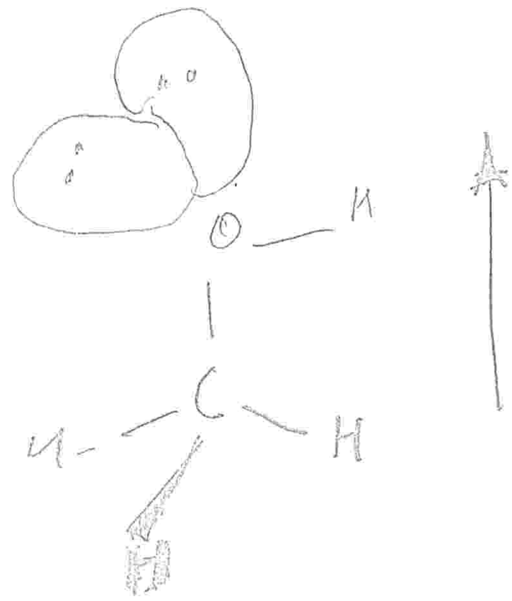


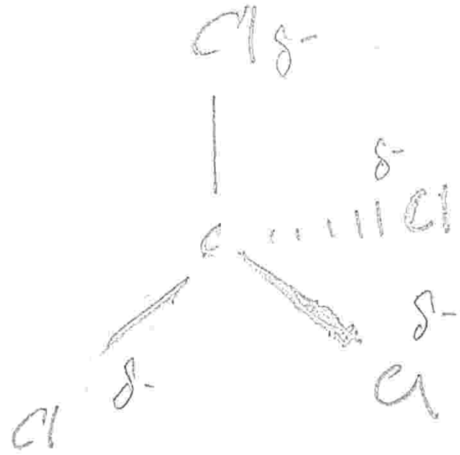
DIPOLE MOMENT

$\mu = Qr$

↳ SEPARATED CHARGE

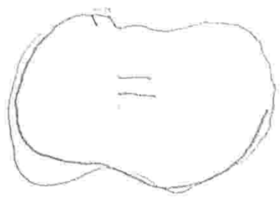






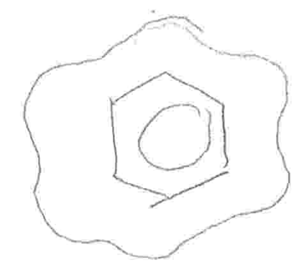
FUNCTIONAL GROUPS

ALKENE

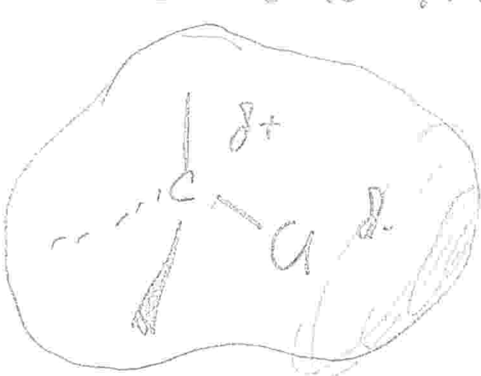


ALKYNE

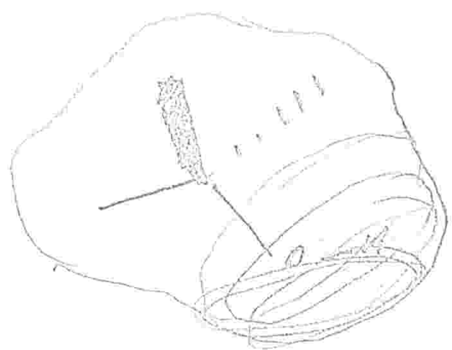
ARENE



CHLOROMETHANE



METHANOL



ACETONE