

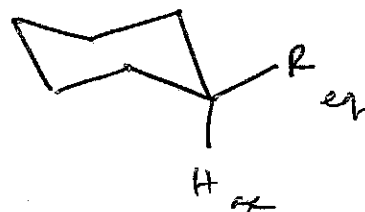
Course 343Lecturer HockenbergerDay MonDate 10/28/2013Notes Taken By AdamsTotal # of Pages 6

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Exam: - same locations as last time

- Models allowed

- Draw chairs correctly



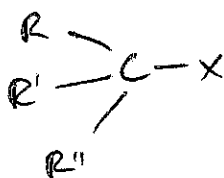
- Exams given back Friday after class

• Ch 8 problems: 2, 4, 6, 12, 14-20, 23, 24, 26-32, 33, 34, 39-44,
 46, 48, 49, 52, 53, 55-62

not C

Ch 8: Alkyl halides, alcohols, ethers, thiols, thioethers

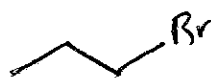
• Common theme:



R = alkyl, H

X = electronegative atom (halogen, O, S)

Alkyl halides: F, Cl, Br, I



≡ propyl bromide
or

bromopropane

Course 343

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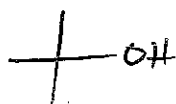
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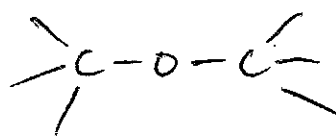
Alcohols:



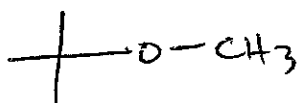
tert-butanol

- important solvents
- mildly acidic OH

Ethers:



THF



diethyl ether

methyl-tert-butyl ether

important solvents

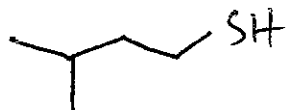
- Thiol: sulfur analogues of alcohols $R-SH$
- Thioethers: sulfur analogues of ethers $R-S-R$

examples of thiols:

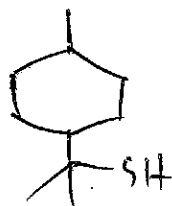


tert-butylthiol

(additive to natural gas)




in skunks



in grape fruits

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- Common solvents: need to understand physical properties
 - Polarity! Polar vs non-polar
 - Polarity: 2 key parameters:
 - 1) Dipole moment (μ) = property of a single molecule
 - 2) Dielectric constant (ϵ) = property of the bulk material
- example: alkanes: $\epsilon = 2$ (larger ϵ = more polar)
H₂O $\epsilon = 78$
- Polarity affects the physical properties of a molecule
 -  - more polar molecules have higher melting/boiling pts
 - Polar and non-polar molecules are often immiscible (they don't mix well)
- example: oil/water or oil/vinegar

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Chemical example:

$$\mu = 1.7 \text{ D}$$

$$\epsilon = 7.5$$



partially miscible w/ H₂O



not miscible w/ H₂O

$$\mu = 0$$

$$\epsilon = 2$$

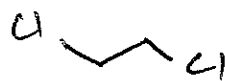
• Small chlorocarbons are common solvents

- all are non-polar (although C-Cl is polar)

ex: CCl₄, CHCl₃, CH₂Cl₂,

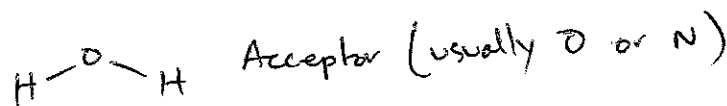
chloroform

methylene
chloride



dichloroethane

• H-bonding capacity strongly effects solvent properties



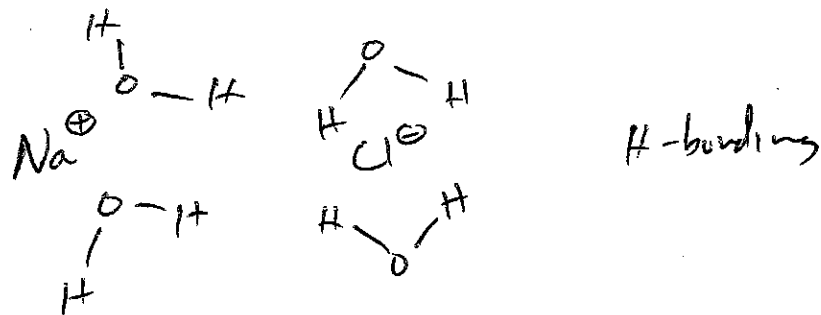
correlates w/ ability to dissolve ions/salts

• present in "bulk" \rightarrow high boiling points

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<u>Ex:</u>	$\text{CH}_3\text{CH}_2\text{OH}$	CH_3OH	H_2O
bp:	78°C	65°C	100°C

• In H_2O , ions can be solubilized



smaller alcohols can also dissolve salts

• Protic vs aprotic solvents

- protic: contains an acidic H ($\text{pK}_a \leq 20$) i.e., OH

ex: H_2O , alcohols

- aprotic: no acidic H's

~~* polar vs~~

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* "Polar vs non-polar" and "protic vs aprotic" are different concepts

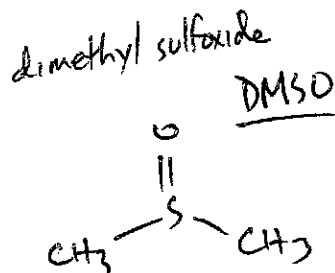
ex:



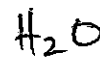
polar
aprotic



non-polar
aprotic



very polar
aprotic



polar
protic

• Supramolecular chemistry

- can construct favorable interactions
- look up ~~some~~ crown ethers