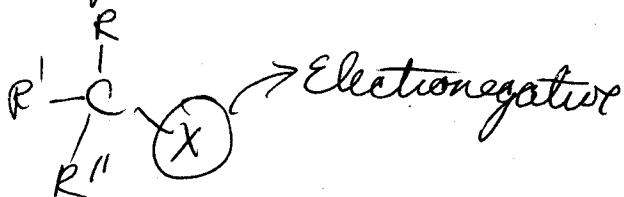


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Chapter 8 - alkyl halides, alcohols, etc.

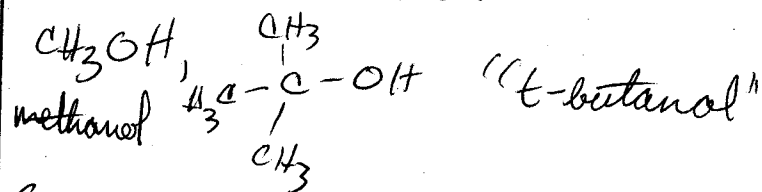


Area Problems: 2, 4, 6, 12, 14-20, 23, 24, 26-32, 33, 34, 39-44, 46, 48, 49, 52, 53, 55-62
C

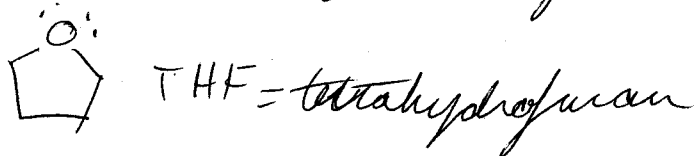
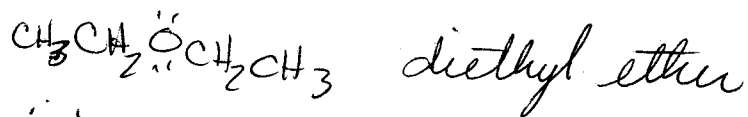
X = F, Cl, Br, I = "alkyl halides"

$\text{CH}_3\text{CH}_2\text{Br}$ "ethyl bromide"

X = OH $\Rightarrow$ alcohol

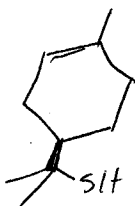
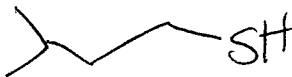


Ethers - X = O, but O has bonds to C on both sides



Thiols: X = SH

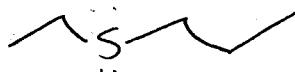
Ex



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Thioethers

Ex:



• Read section on naming, but focus on graphical language

Solvent Properties - alkyl halides, alcohols, ~~ethers~~
Solvent distinctions -

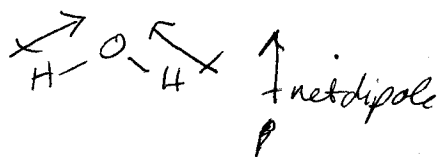
polar vs nonpolar "apolar"

Dipole moment (μ) - property of individual molecules
Dielectric constant (ϵ) = " " liquid

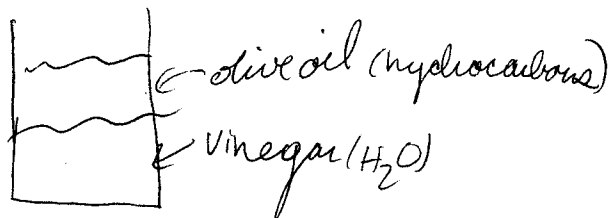
• Larger ϵ , more polar solvent

• Large ~~μ~~ μ usually correlates w/ large ϵ , but not always

Example:

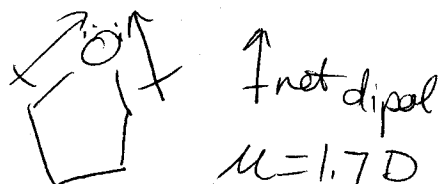


"like dissolves like" - polar vs nonpolar
solutes & solvents



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Specific ex:

 $\mu = 1.7 \text{ D}$ $\epsilon = 7.6$

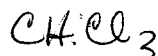
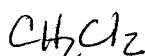
vs

 $\mu = 0$ $\epsilon \approx 2$ Partially miscible w/ H_2O

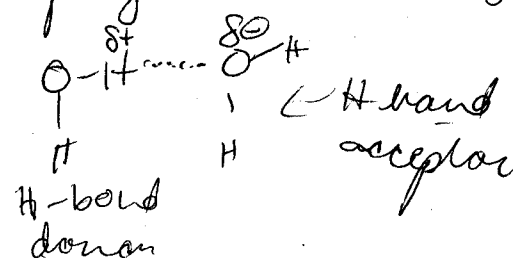
non polar

Not miscible in water

Note: Small alkyl halides (esp. chlorides) are common organic solvents (nonpolar)

 $(\mu = 0)$

Hydrogen bonding - large impact on solvent properties



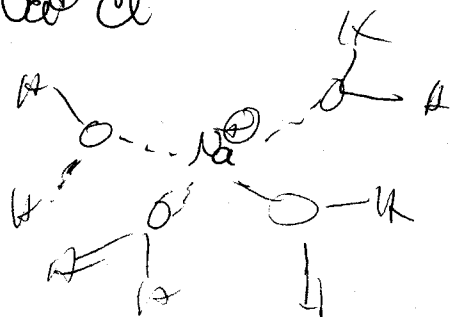
Recognize

H-bond donors as Brønsted acid ($\text{p}K_a \leq 20$)

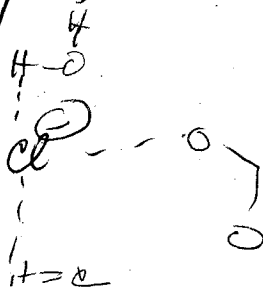
H-bonding capacity correlates w/ ability to dissolve salts (i.e., ions)



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ion dipole interactions



H bond donation to anion

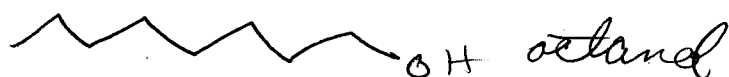
a second solvent distinction "protic" vs "aprotic"

Can't see an H w $\text{pK}_a \leq \sim 20$

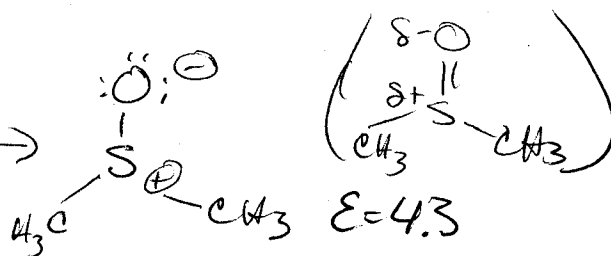
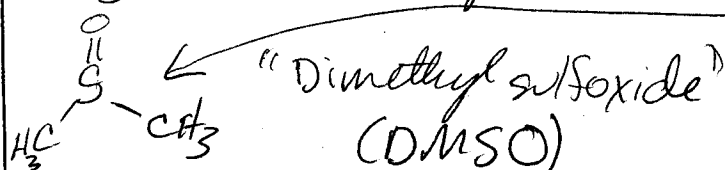
"So all alcohols are "protic"

Note: polar vs nonpolar
protic vs aprotic

Related but not completely parallel classifications
• protic, but not very polar



• very polar but aprotic



Course CH 343 Lecturer Sam Hellman
Day Friday 1/20 Date 10/28/11
Notes Taken By Alicia Phelps Total # of Pages 5

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Designer solvation shells ("molecular engineering")
"Crown ethers"

