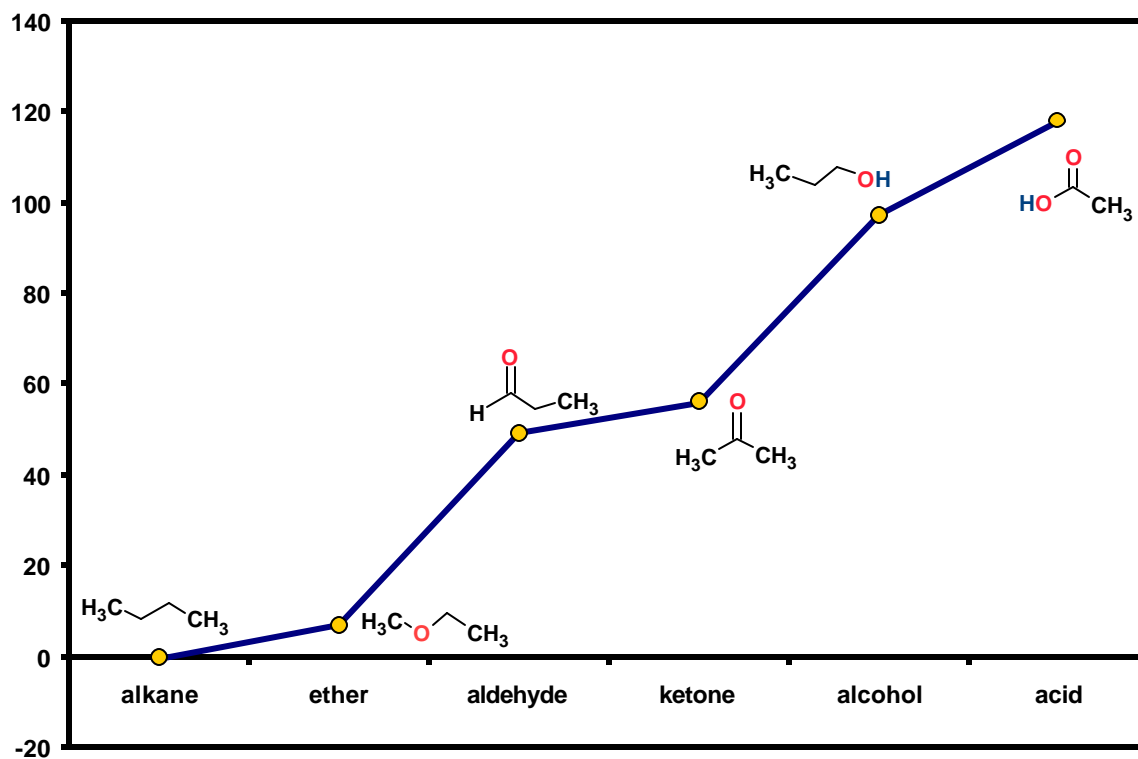
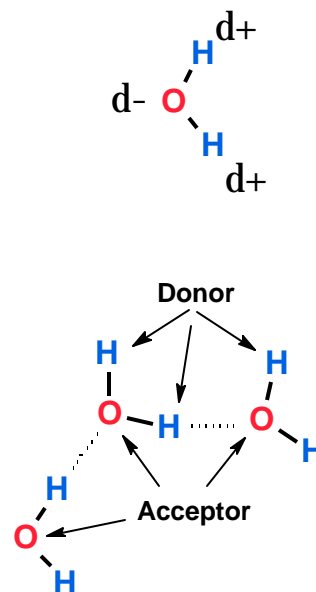
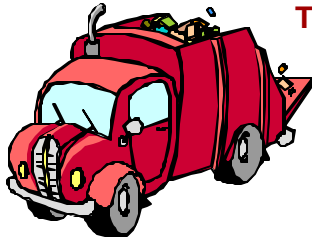


Structure	Name	M.W.	H-Bond Donors	H-Bond Acceptors
<chem>CCCC</chem>	Butane	58	0	0
<chem>COC</chem>	Methylethylether	60	0	1
<chem>CCC=O</chem>	Propanal	58	0	1
<chem>CC(=O)C</chem>	2-Propanone	58	0	1
<chem>CCCO</chem>	1-Propanol	60	1	1
<chem>CC(=O)O</chem>	Ethanoic acid	60	1	2

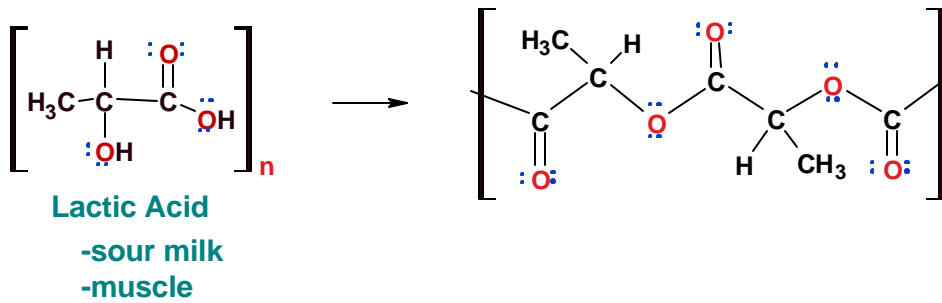
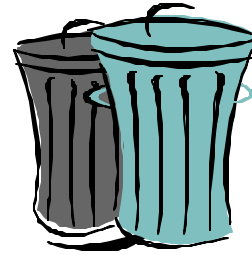


## Garbage Trouble

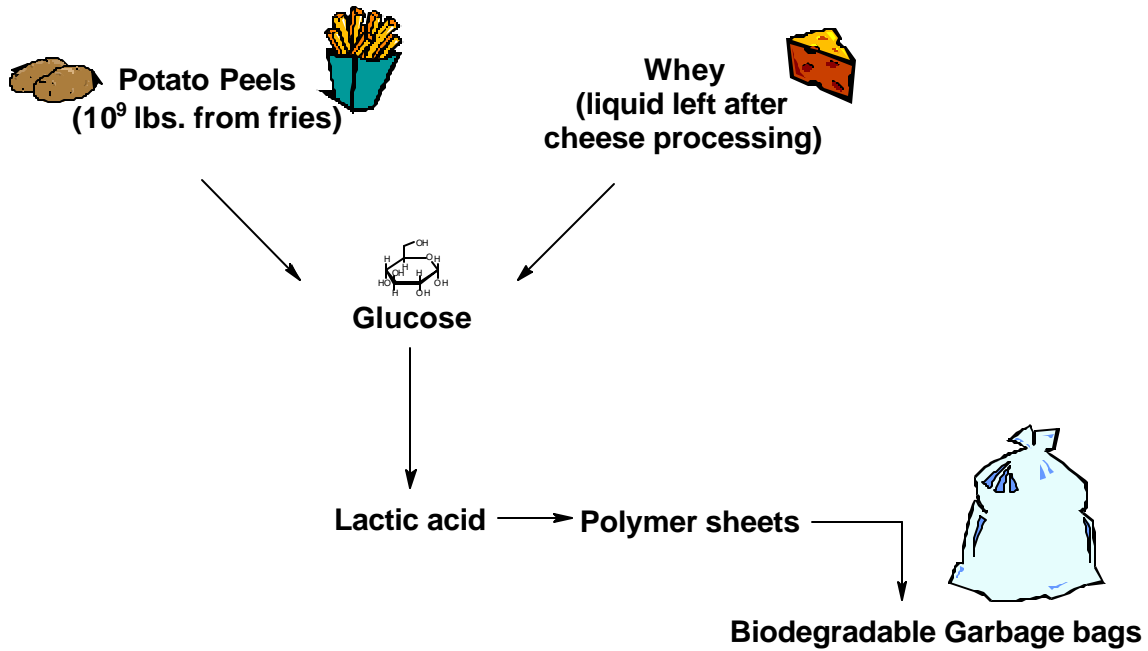


**Trash bag buried in land fill**

- Bacteria can't get inside to degrade garbage!
- Need a biodegradable trash bag



**Get lactic acid from GARBAGE!**



# Common Carboxylic Acids

## General Characteristics:

- Sharp, sour tastes



- Bad smells

- goats, old sneakers

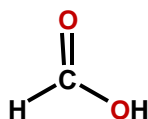


## 1) Formic Acid

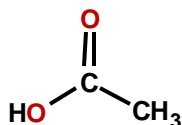


- simplest

- causes sting of ant bites



## 2) Acetic Acid

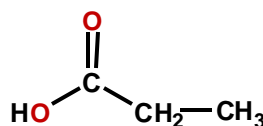


- cider and honey fermentation → vinegar (4-10% acetic acid)

- Pure acetic acid freezes at 16°C (glacial acetic acid)

## 3) Propanoic Acid

- Tang of Swiss Cheese

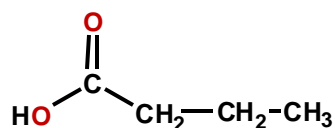


## 4) Butyric Acid

- Rancid Butter

- Body Odor

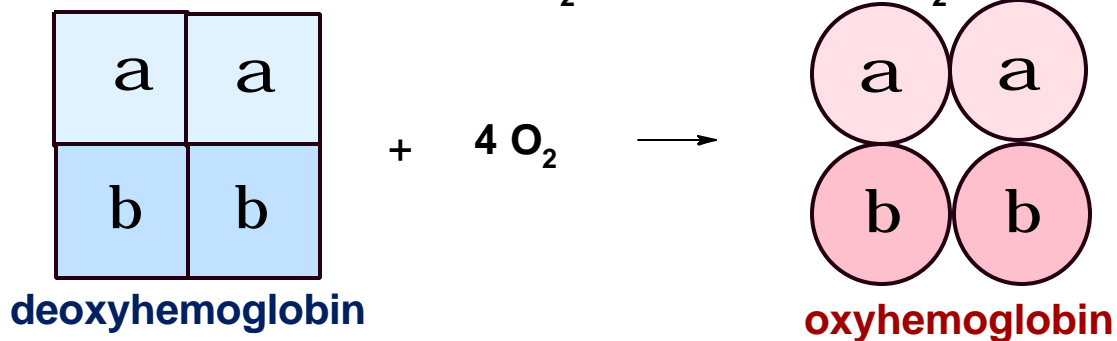
- Gas Gangrene



## Fetal Hemoglobin

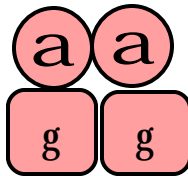
**Hemoglobin is the protein that:**

- carries  $O_2$  from **lungs** to **tissues** and
- wastes from **tissues** to **lungs**
- found in red blood cells
- each Hb has 4 subunits, 2a and 2b
- each subunit binds  $O_2$  so 1Hb binds 4  $O_2$



### Fetal Hb

Has 2a and 2g and higher affinity for  $O_2$  than adult Hb  
so that  $O_2$  can be transferred to fetus



When born, change over from g to b production

Found that at birth have high butyric acid levels in blood

rancid butter?  
gas gangrene?

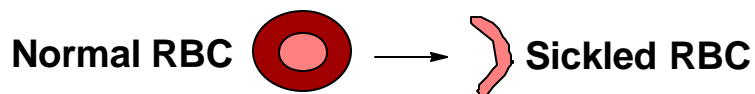
## Butyric Acid and Sickle Cell Anemia



### Sickle Cell Anemia

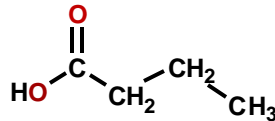
a mutation in the  $\beta$  subunits of Hb causes Hb to form insoluble chains

these insoluble chains cause the red blood cells to form a sickle shape



Causes severe pain and decreased  $O_2$  transfer

### Butyric Acid Treatment



Noticed that butyric acid high in newborns still making fetal Hb ( $\alpha$  and  $\gamma$  subunits)

Injected patients with Sickle Cell Anemia with butyric acid.

Induced production of healthy  $\gamma$  subunit!!

Replaced mutated  $\beta$  subunit

Often complete reversal of symptoms!!