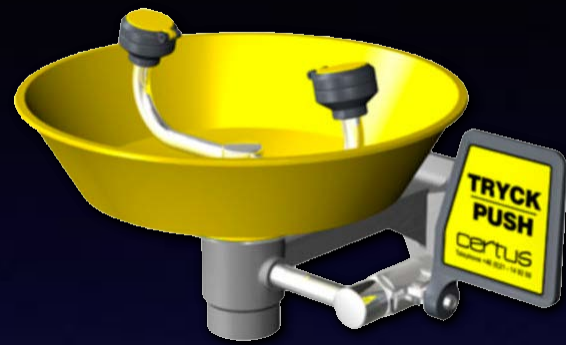


CBC Launch Camp

Tisdag Morgon

Lab safety...



http://www.wallingfordsales.com/prodimages/bradley/s19-310jj_highres.jpg



<http://jouielovesyou.files.wordpress.com/2010/11/1194986420721173922red-telephone-mimoooh-01-svg-hi5b15d.png>

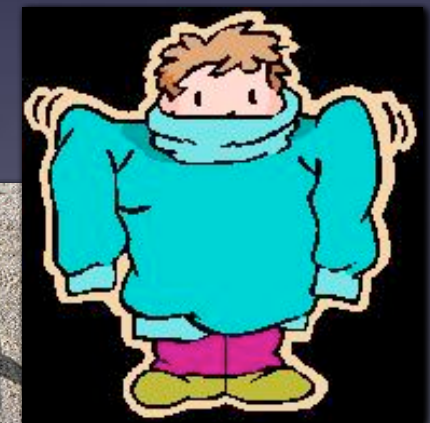
Do you know how to call emergency services?



Required



<http://go.funpic.hu>



Forbidden

Campus emergency services
x5555

508–831–5555



The Arch of Safety

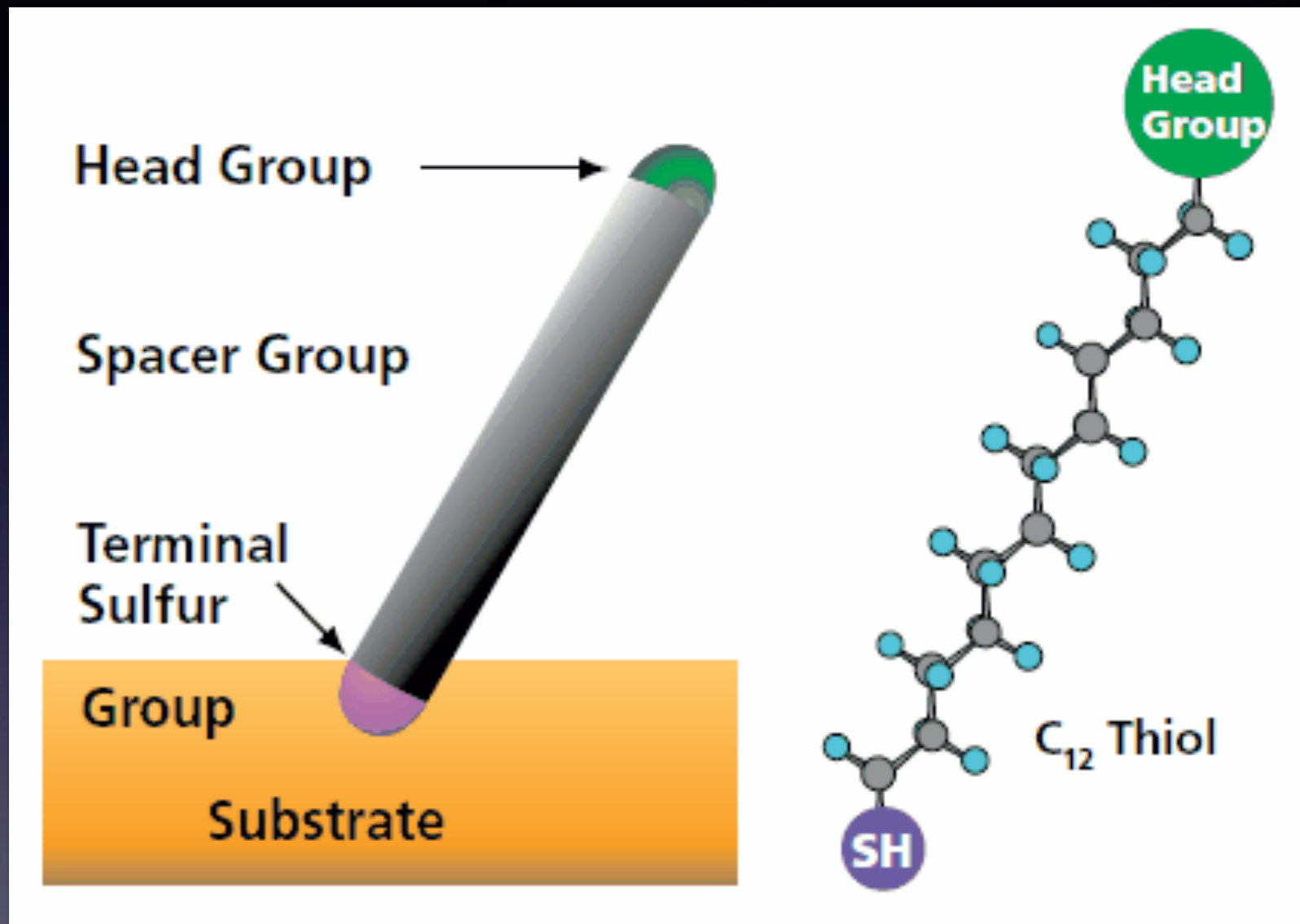
- Where is the campus phone?
- Eyewash?
- Safety shower?

The Arch of Safety

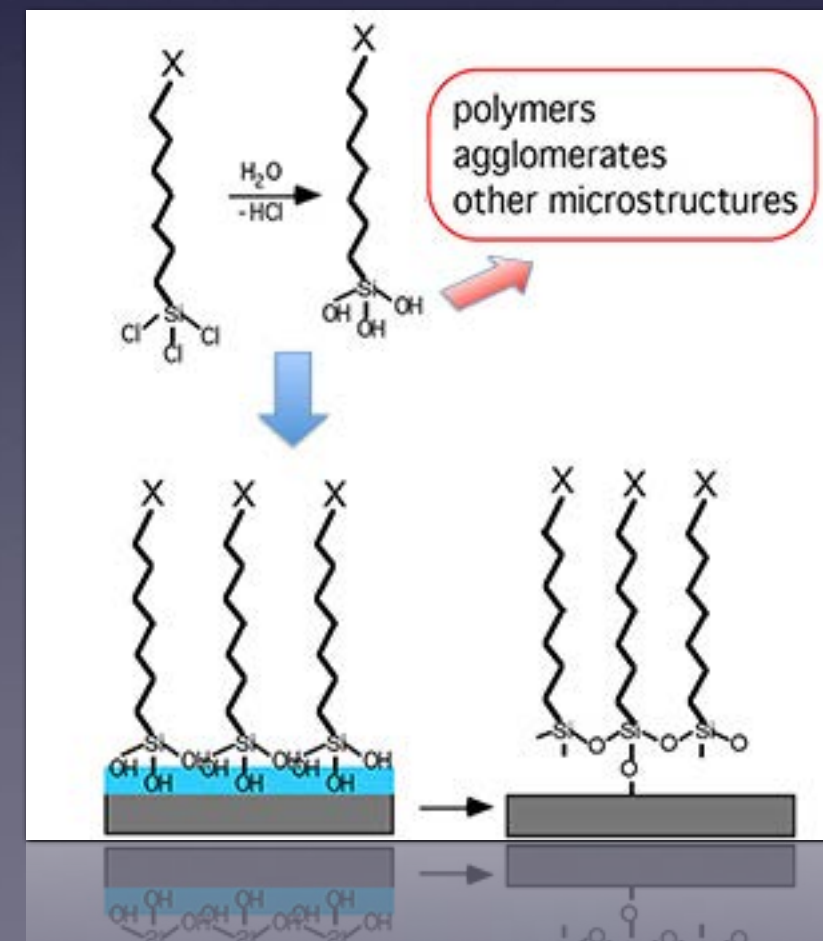


- Where is the campus phone?
- Eyewash?
- Safety shower?

Morning: Self Assembly

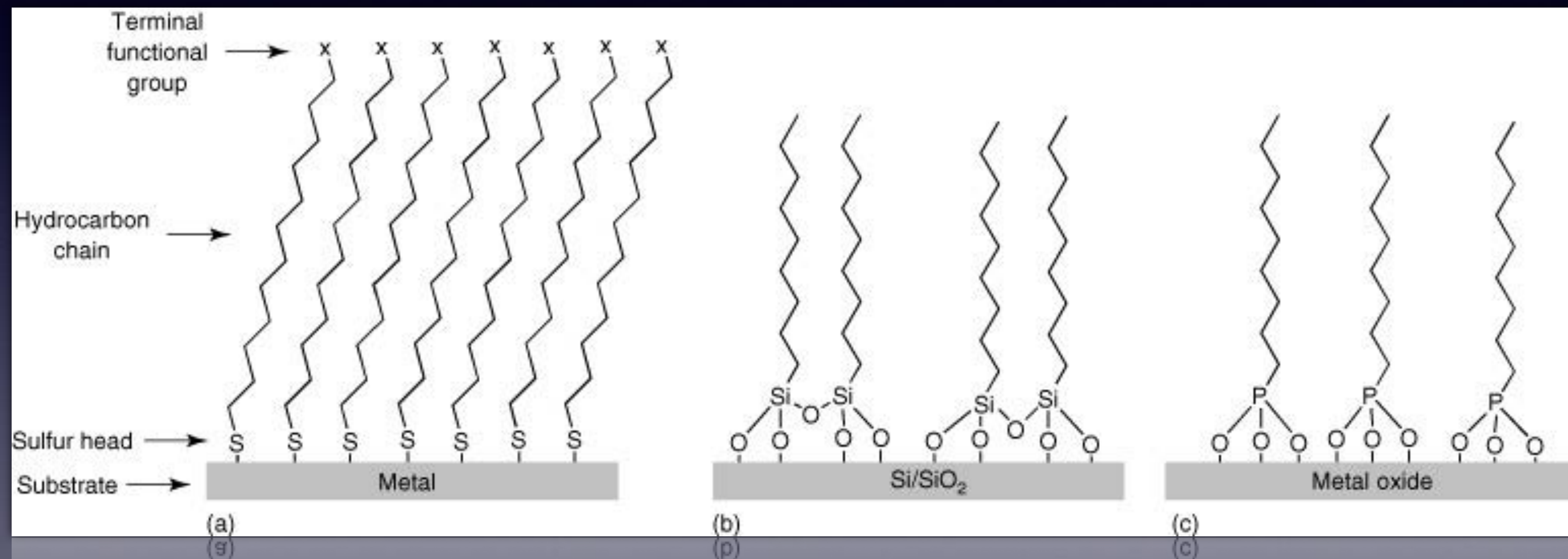


- **Thiols** (hydrocarbons with $-SH$) on **gold or silver**
- Also called **mercaptans**



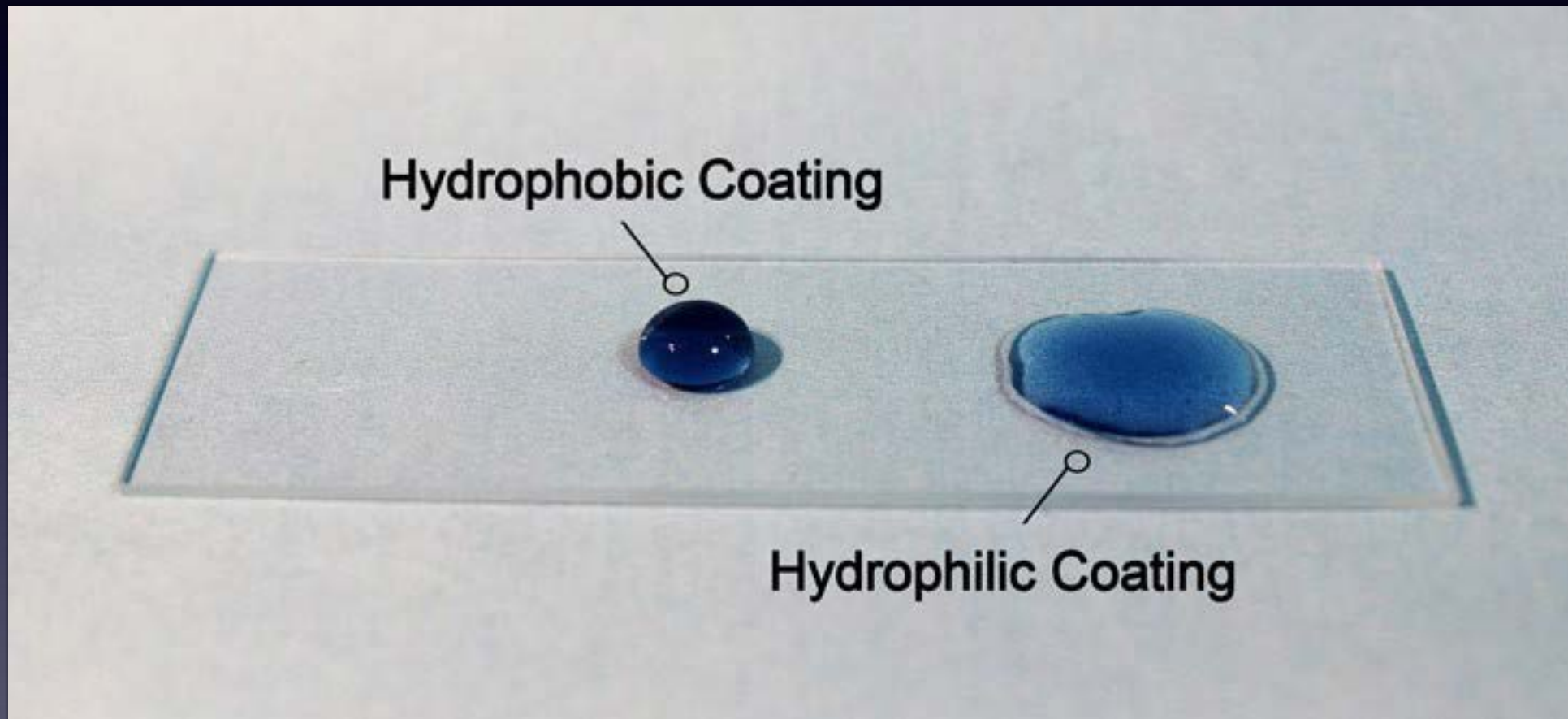
- **Silanes** on **glass**

Self-assembled monolayers (SAM)s



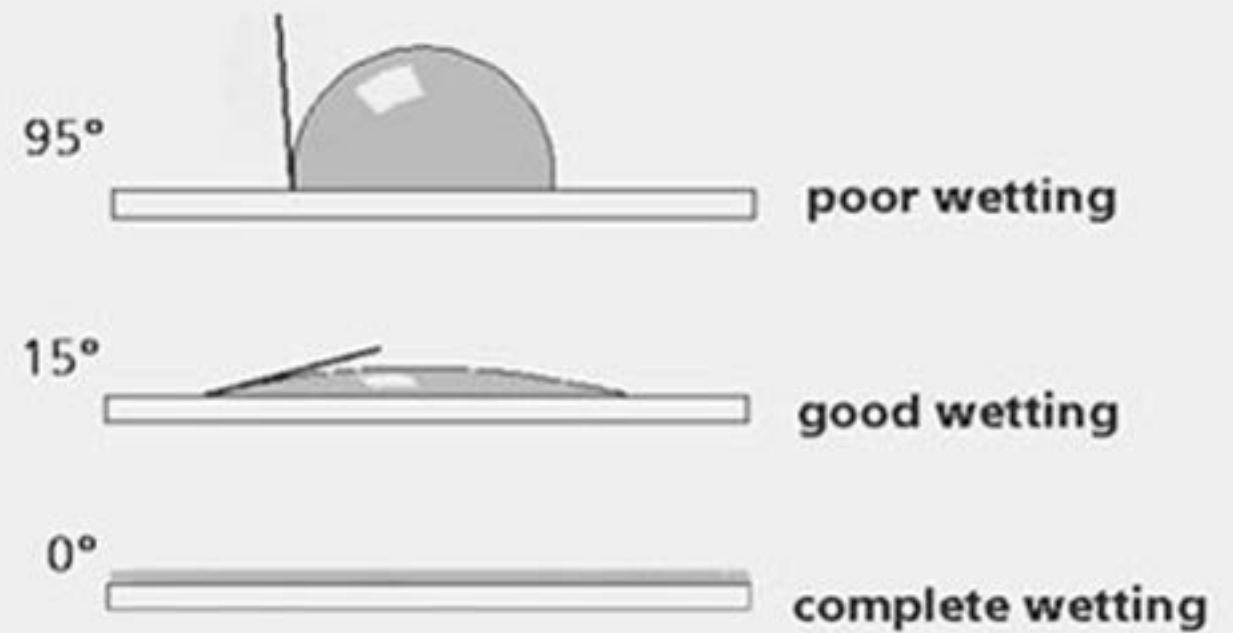
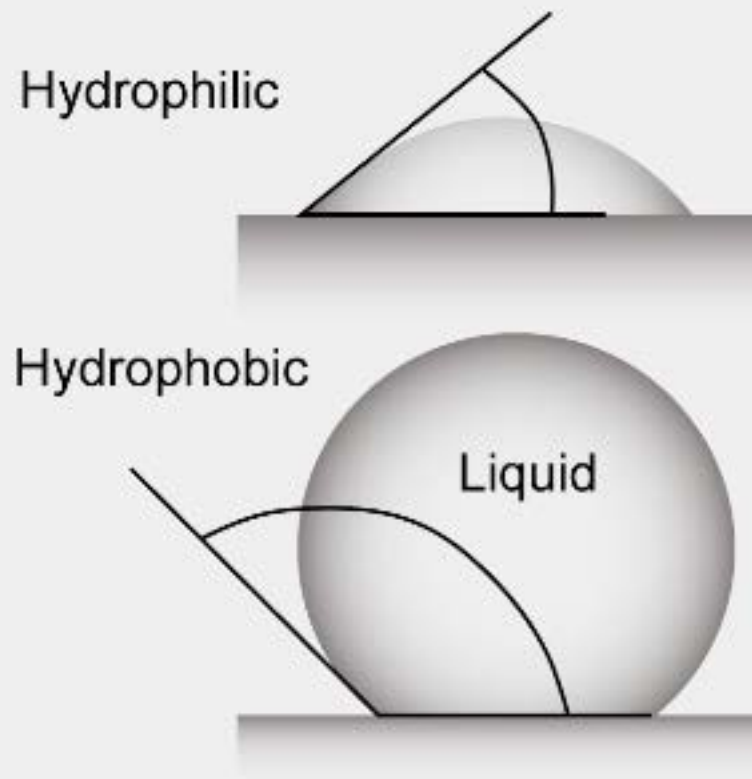
Surface adopts the chemical properties of the terminal functional group

Our application:

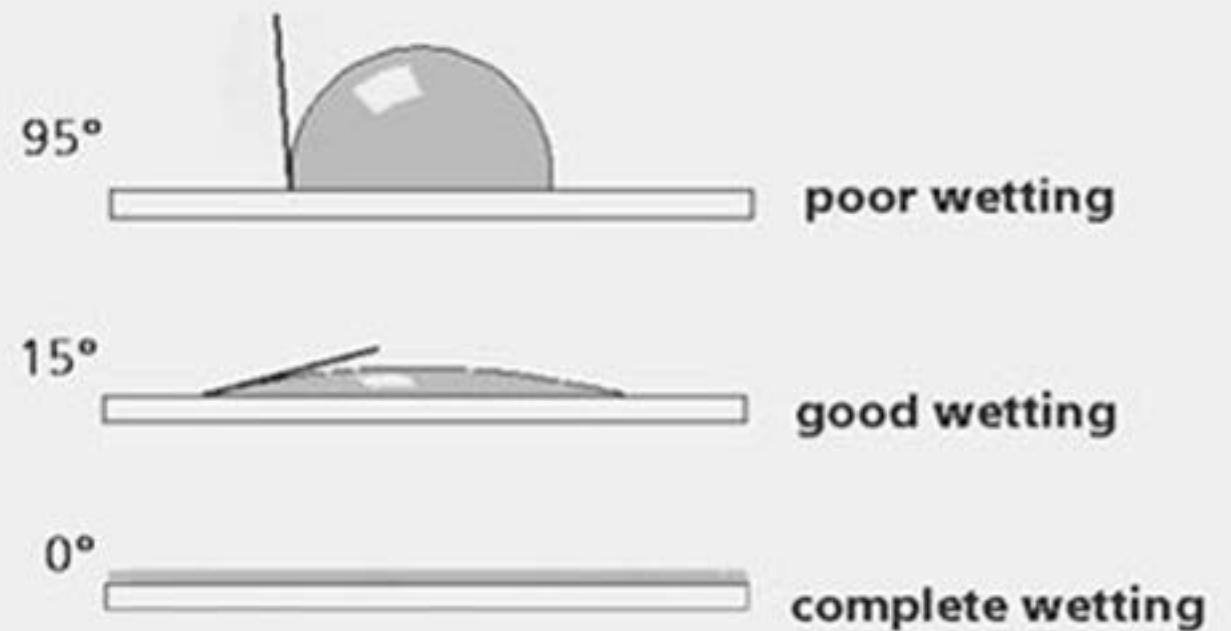
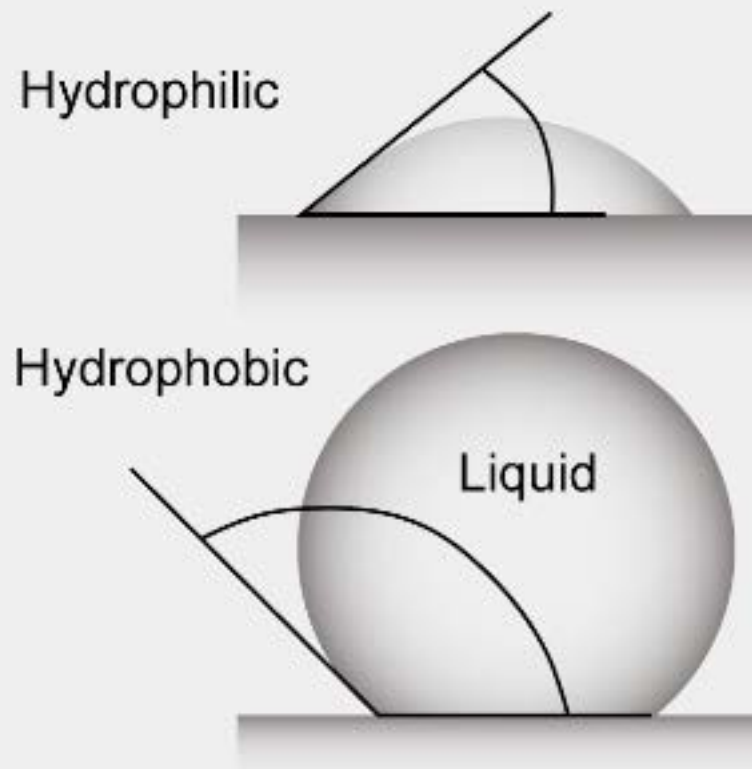


Hydro- { phobic
phillic

Hydrophobic Coating Works

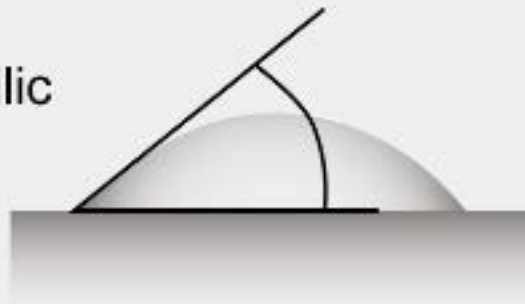


Hydrophobic Coating Works

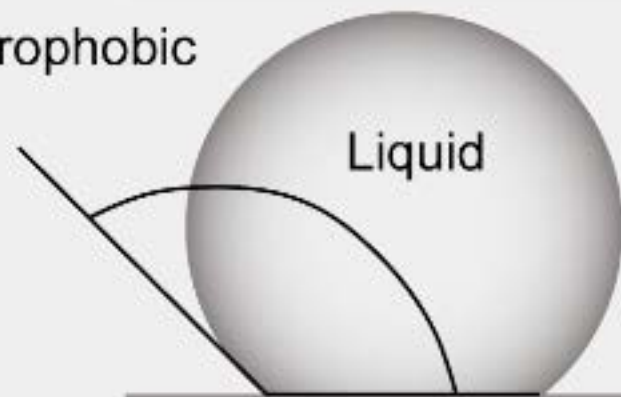


Hydrophobic Coating Works

Hydrophilic



Hydrophobic



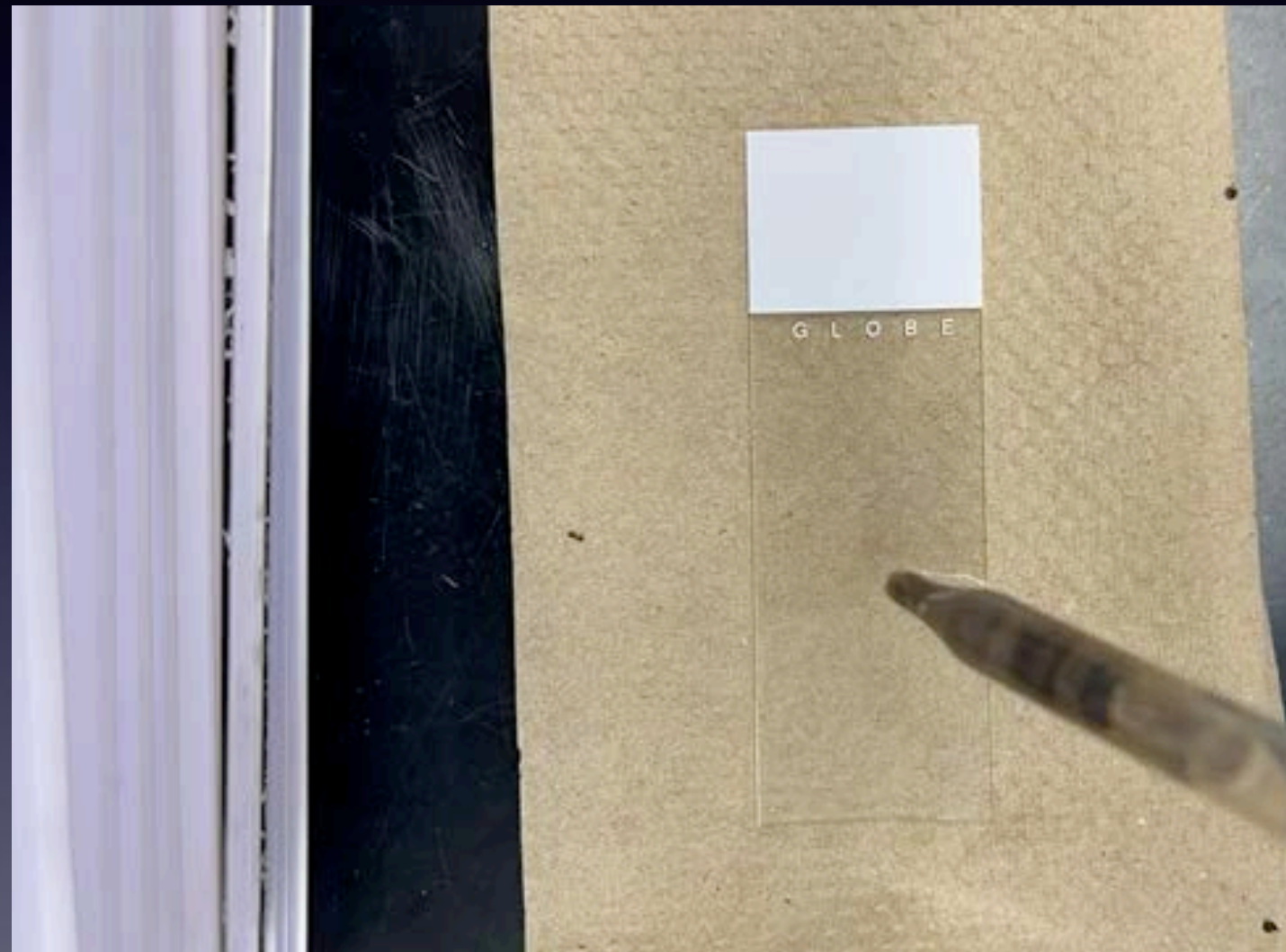
Lotus leaf

Your procedure: broad strokes

1. Make a silver surface
2. React a thiol with that surface to create a SAM
3. Test hydrophobic/hydrophilic nature
4. If time: try patterning one thiol on the surface and filling in with the other!

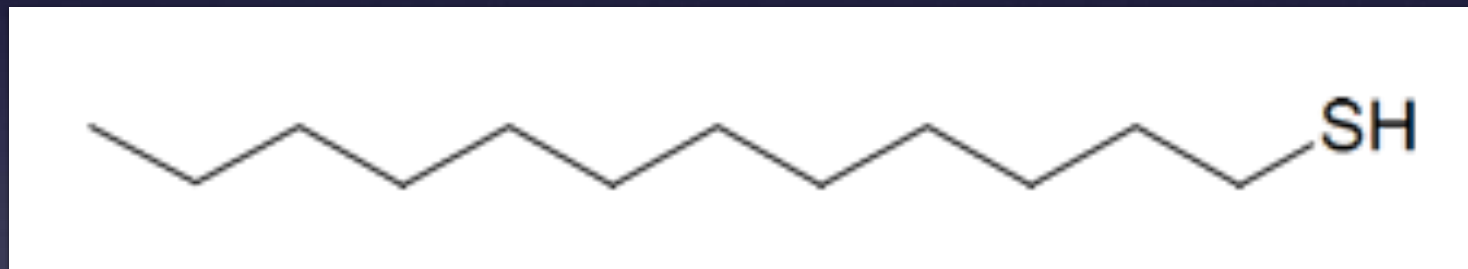
Silvering a surface

1. Clean glass slides in soapy water at sink. Rinse and dry.
2. Place **8** drops of **silver nitrate** solution on glass slide
3. Add **1** drop **ammonium hydroxide** (*a precipitate will form... wobble the slide to get it to go away*)
4. Add **4** drops **potassium hydroxide** (*a dark precipitate will form... wobble the slide to get it to go away*)
5. Add 1–2 drops **ammonium hydroxide** *if and only if the dark precipitate does not fully go away!*
6. Add **4** drops **glucose**. Wobble to mix.
7. Let slide sit for 1–2 minutes then pour off excess liquid into a waste beaker. Leave the slide wet, wait for silver to form
8. Rinse with a water or ethanol. Let dry in air for a few minutes. Do not wipe!

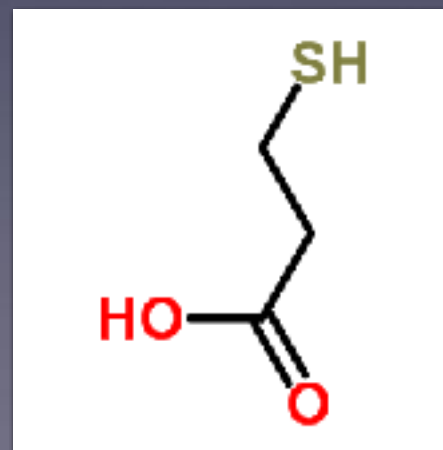


Creating SAM surfaces

- Dodecanethiol in ethanol



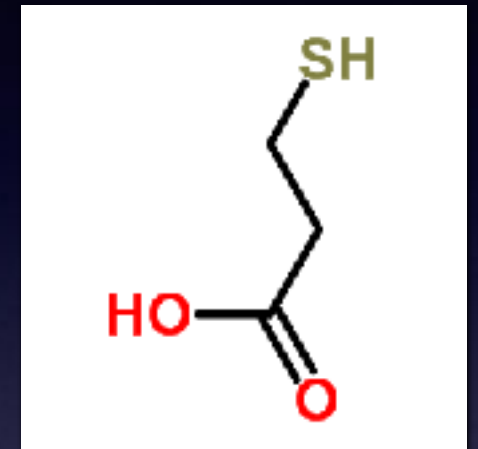
- Mercaptopropionic acid in ethanol



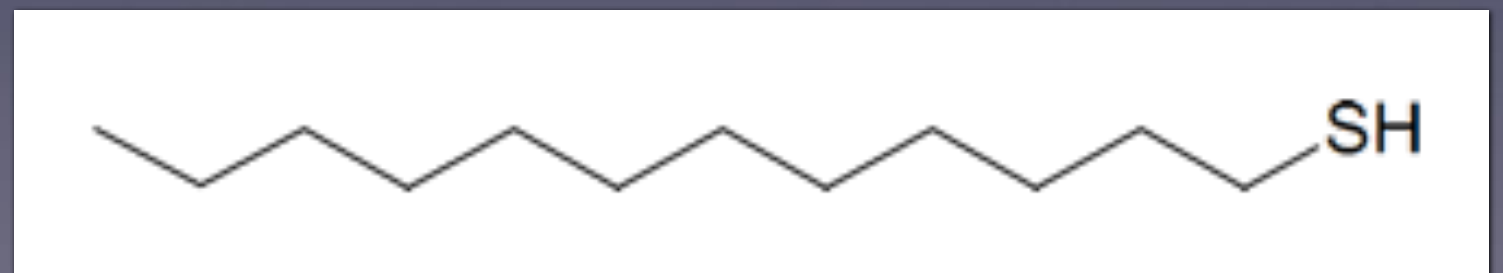
Your procedure

3. Test hydrophobic/hydrophilic nature

- Make a hypothesis about the contact angle between the water and the monolayer
- Test hypothesis by measuring the contact angle with a drop of water



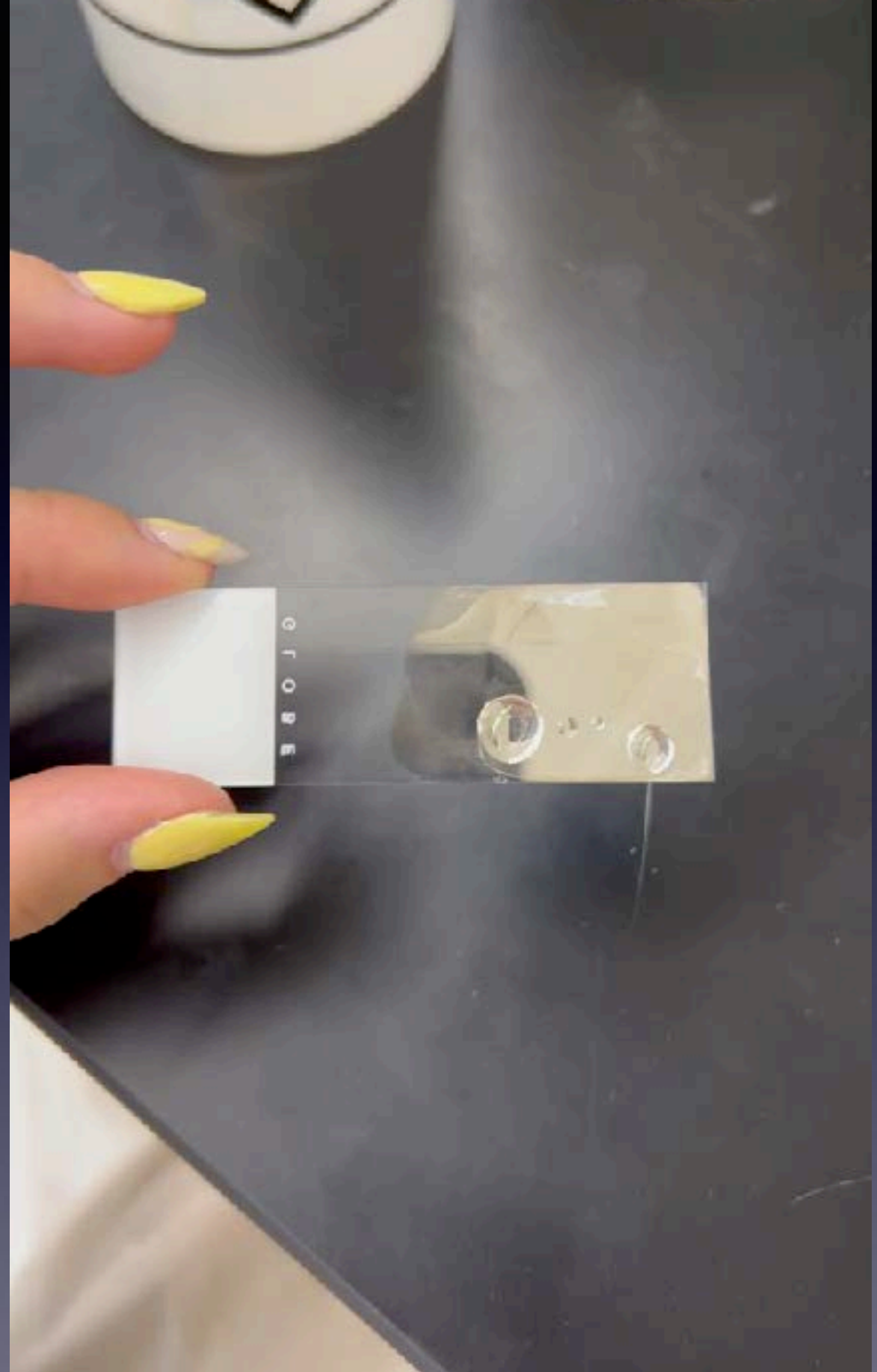
3-mercaptopropionic acid



Dodecanethiol

Creating SAMs

1. Use a dropper to deposit one of the thiols
(If you want two side by side, only deposit a small amount)
2. Wait 1 minute then rinse with ethanol wash bottle. Let air dry



If time...

- Can you make a hydrophilic “island” inside a hydrophobic “sea”?
- Can you make hydrophilic/hydrophobic zebra stripes?
- Can you make other, more complicated patterns?