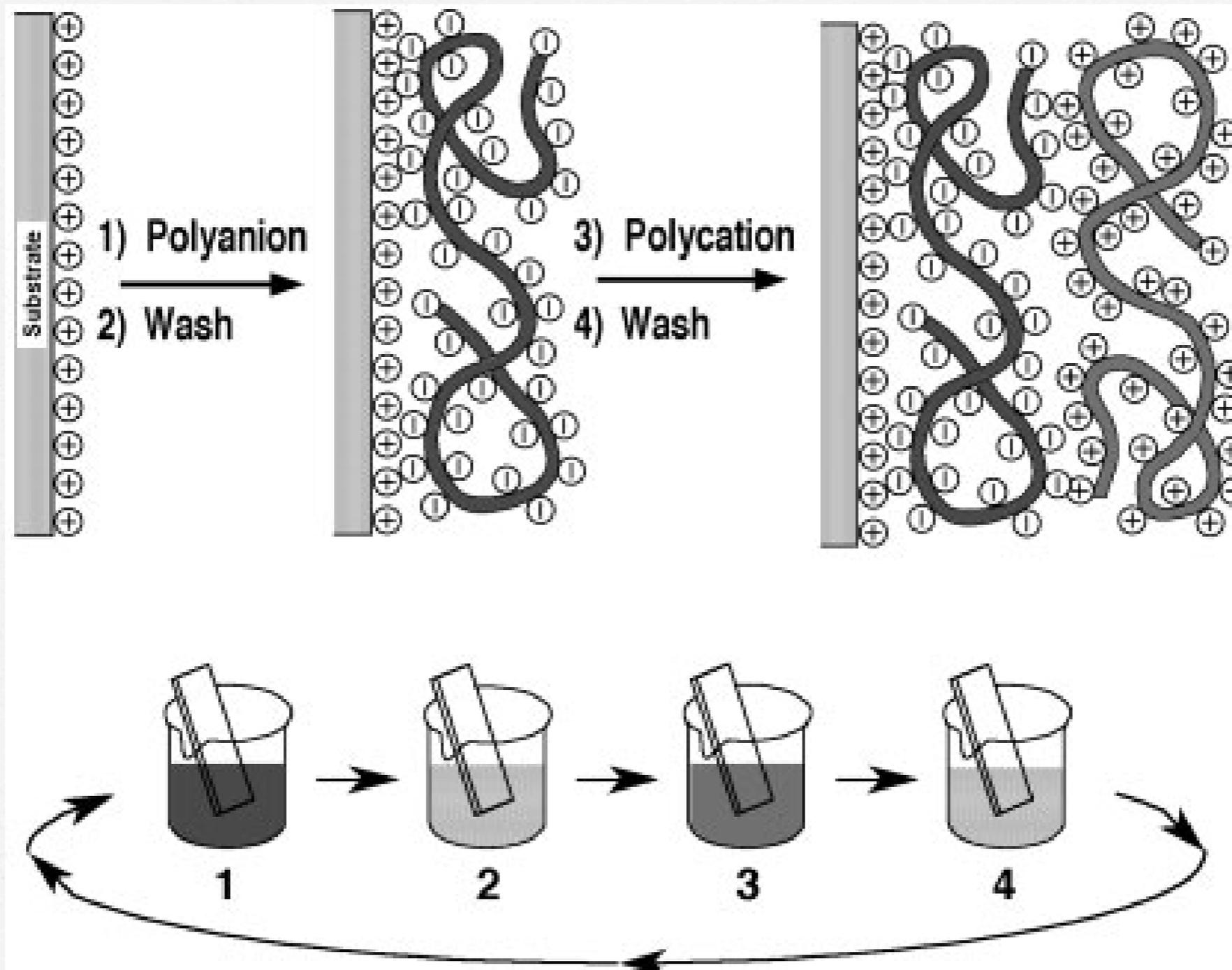


polymer multilayers

layer-by-layer (LbL) adsorption



layer-by-layer (LbL) adsorption

Classic Synthesis

Reagent(s)
(atoms, synthons)



series of
reaction
steps

Product(s)
(typically single species)

LbL - Deposition

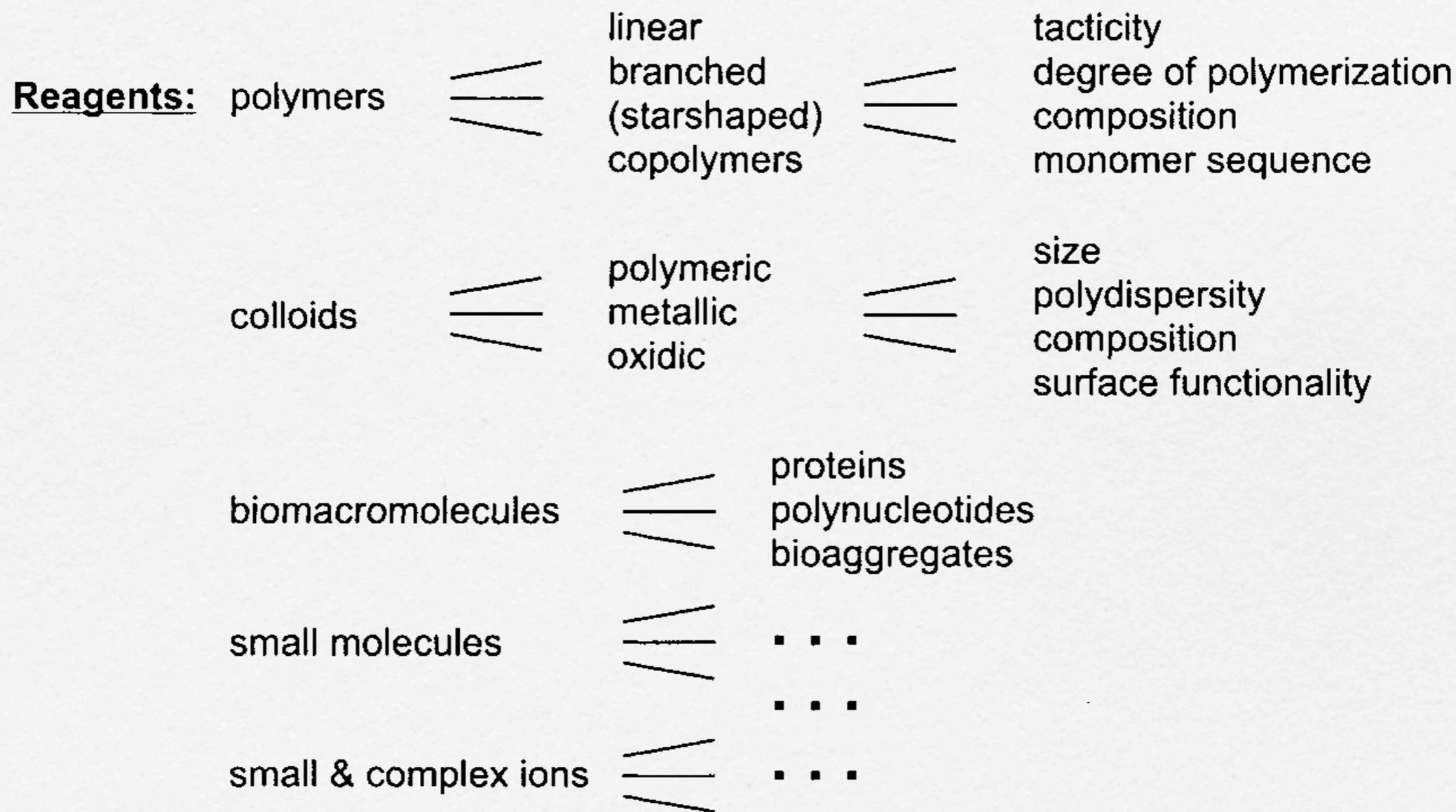
Surface
(template)



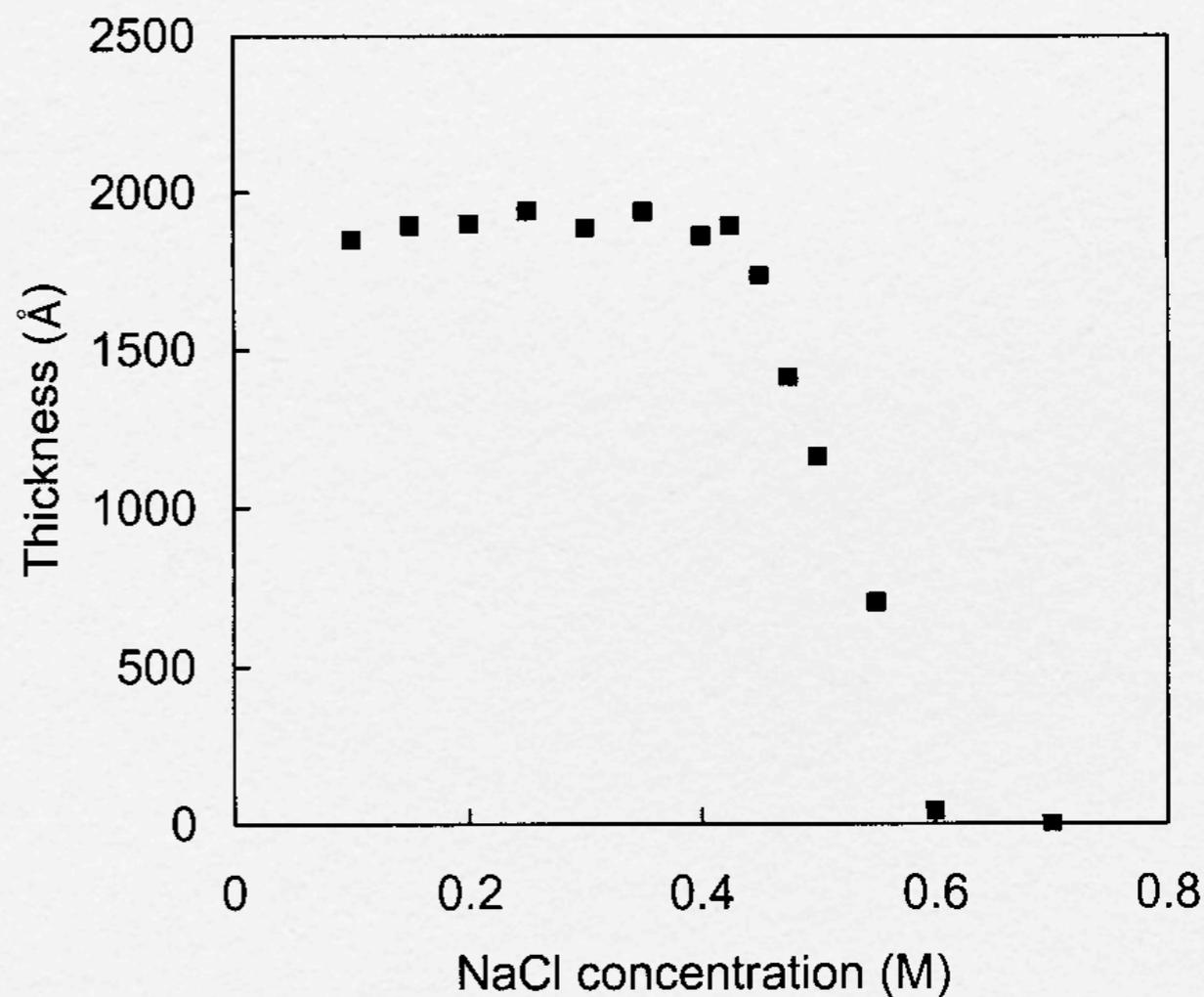
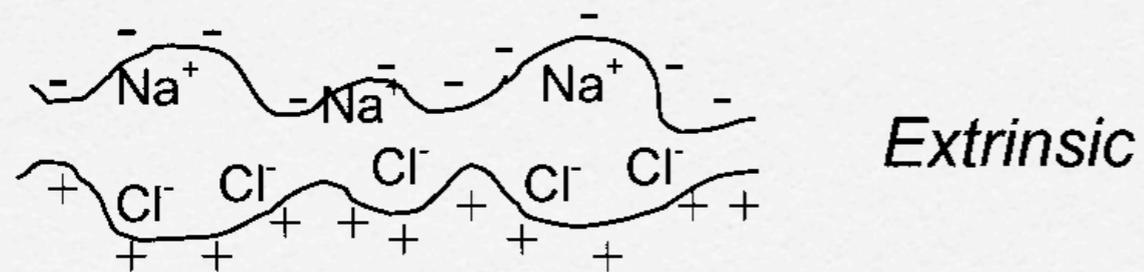
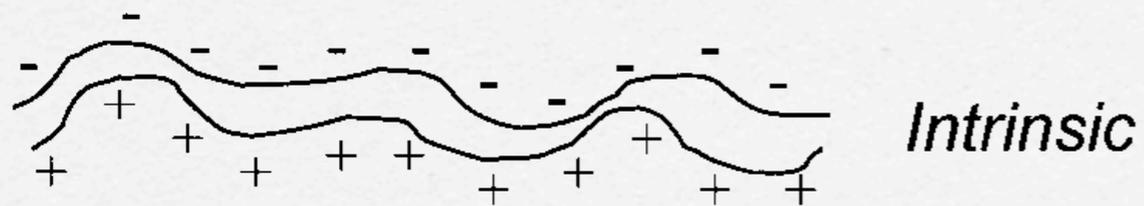
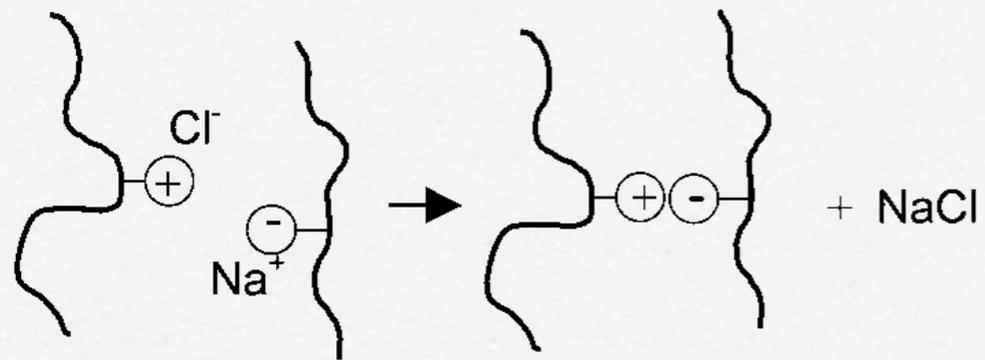
series of
deposi-
tion steps

Multilayer Film
(defined layer sequence)

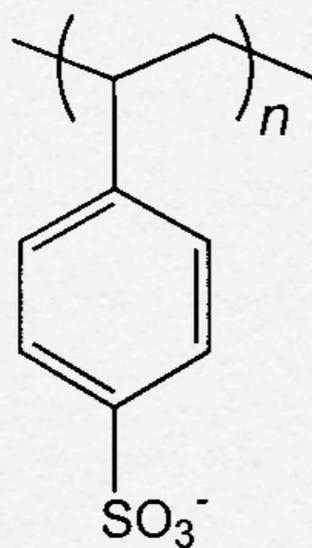
reagents for LbL adsorption



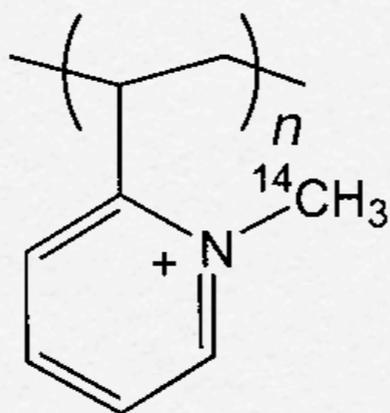
driving force for LbL



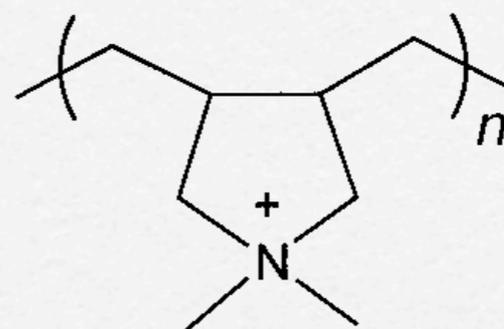
polyelectrolytes for LbL



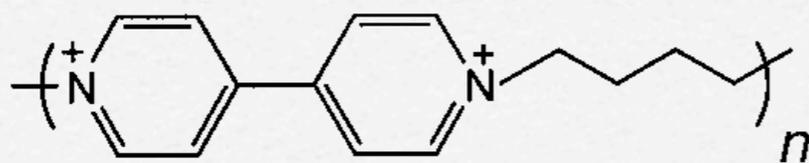
PSS



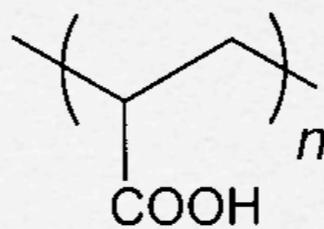
PM2VP



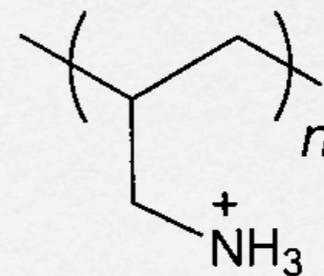
PDADMA



PBV

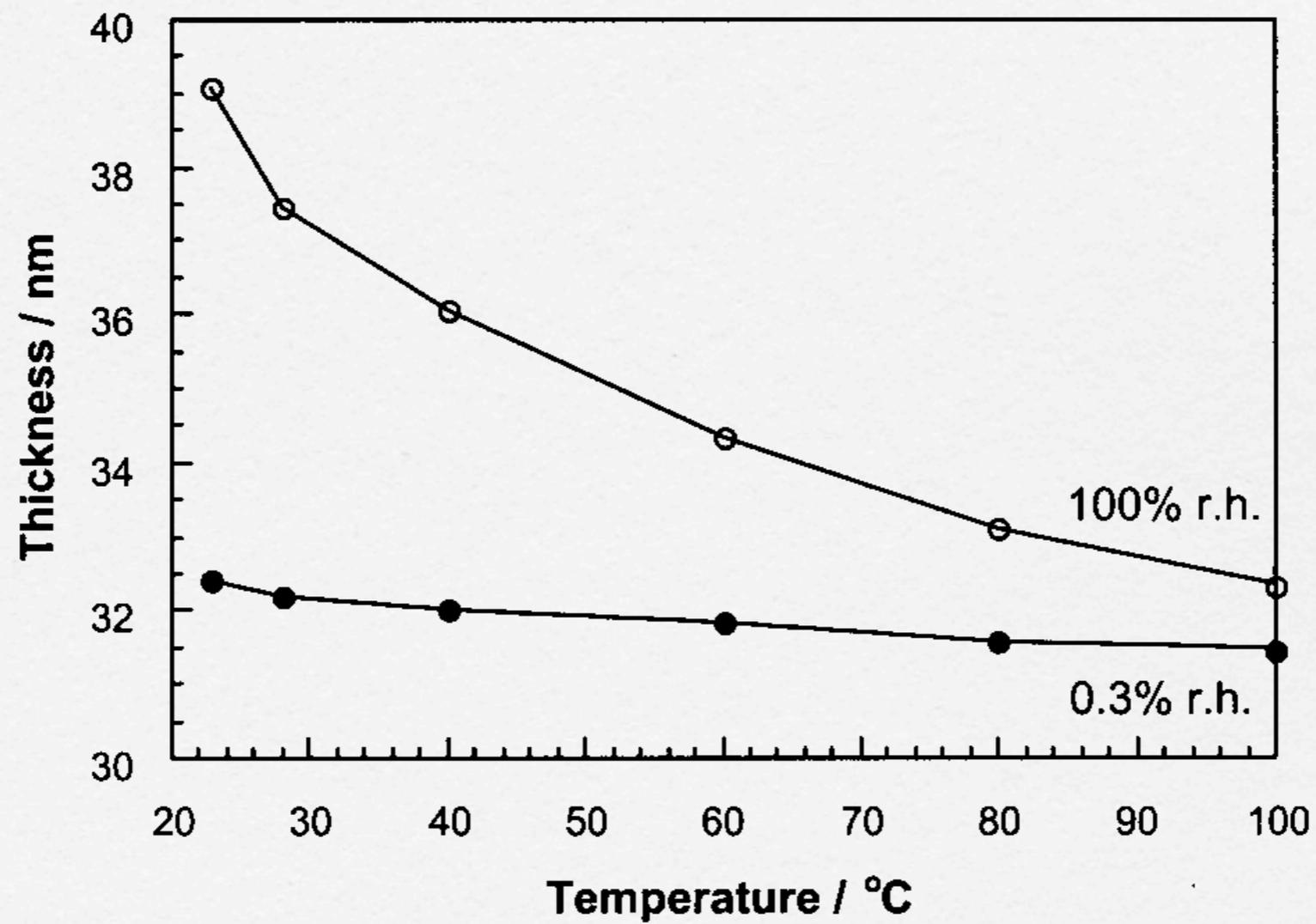


PAA

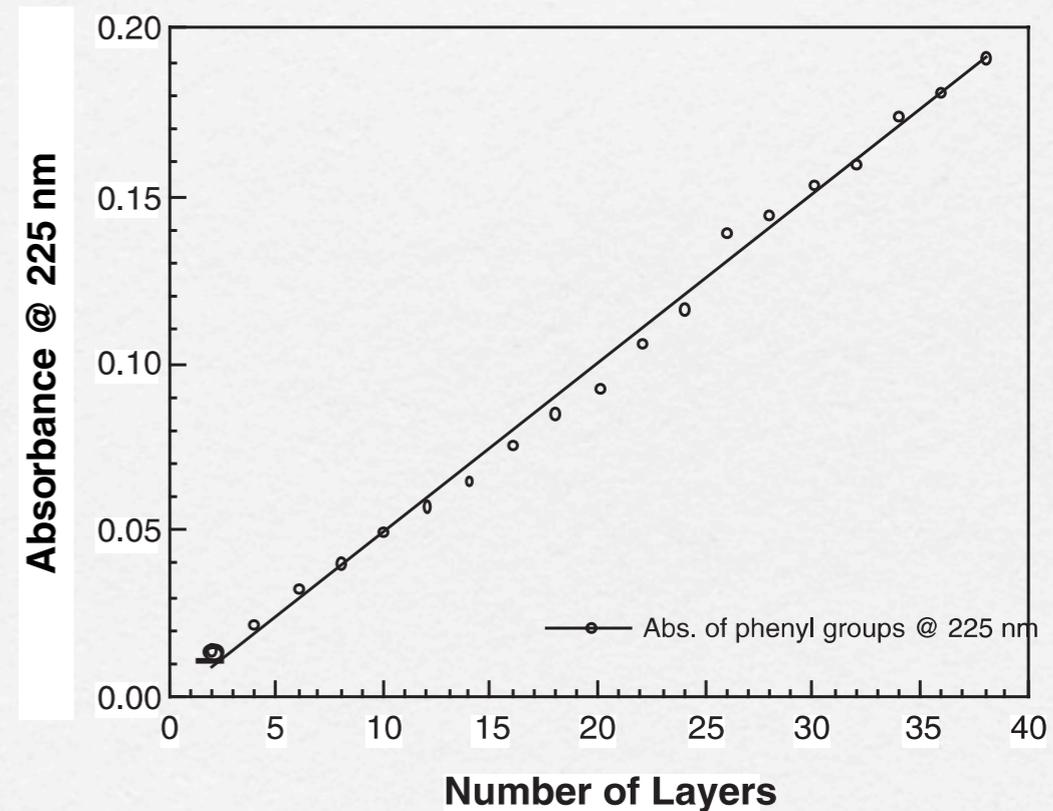
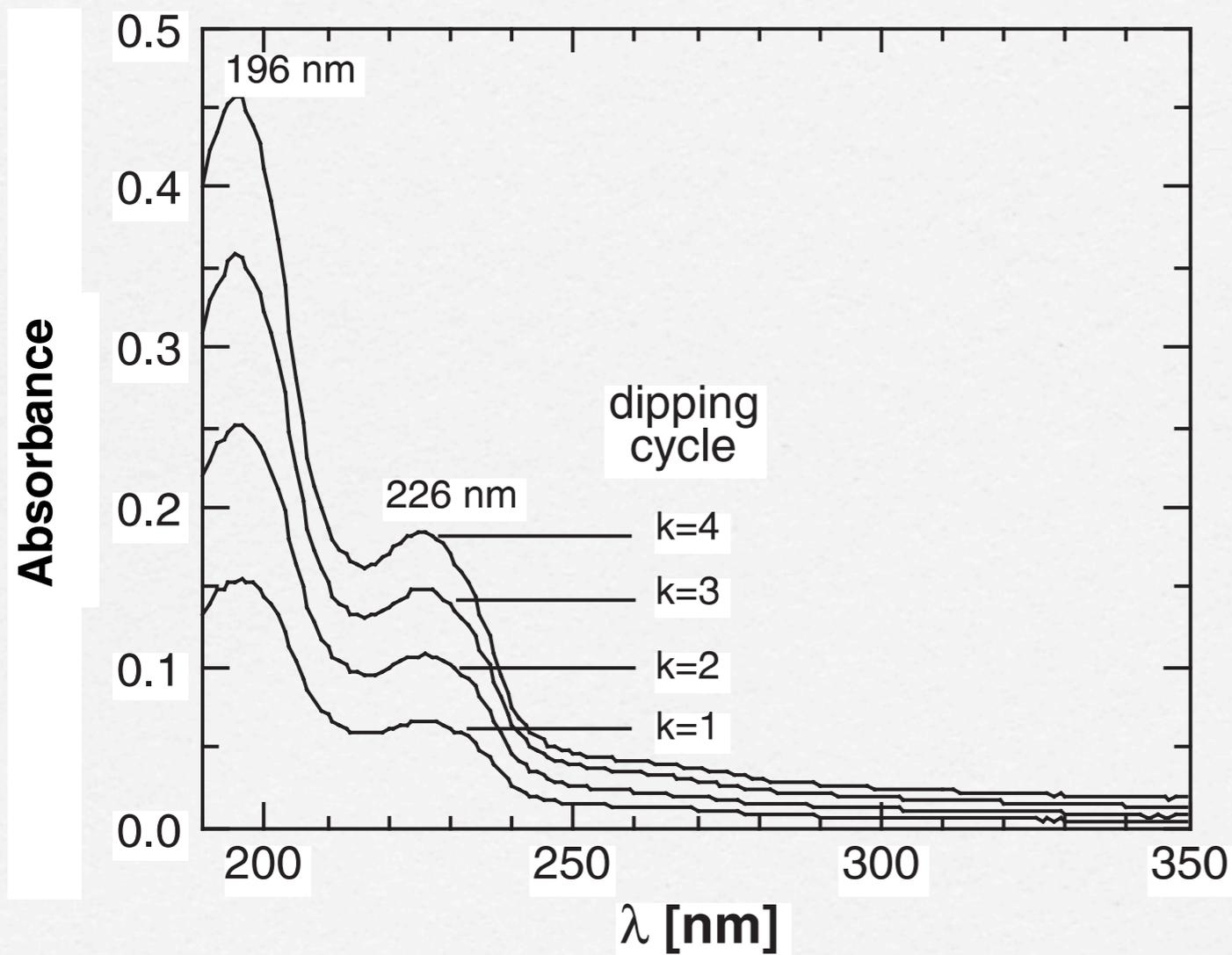


PAH

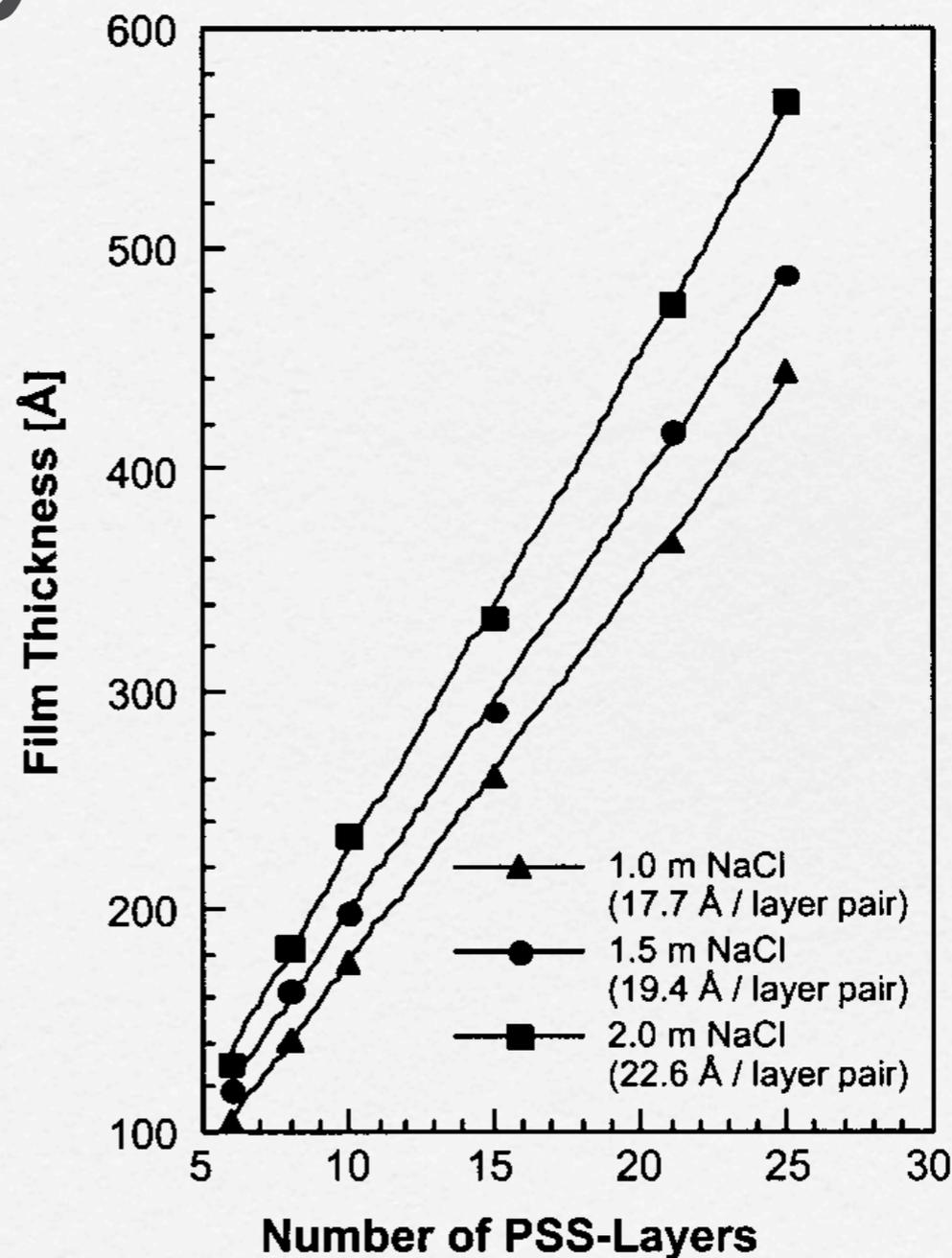
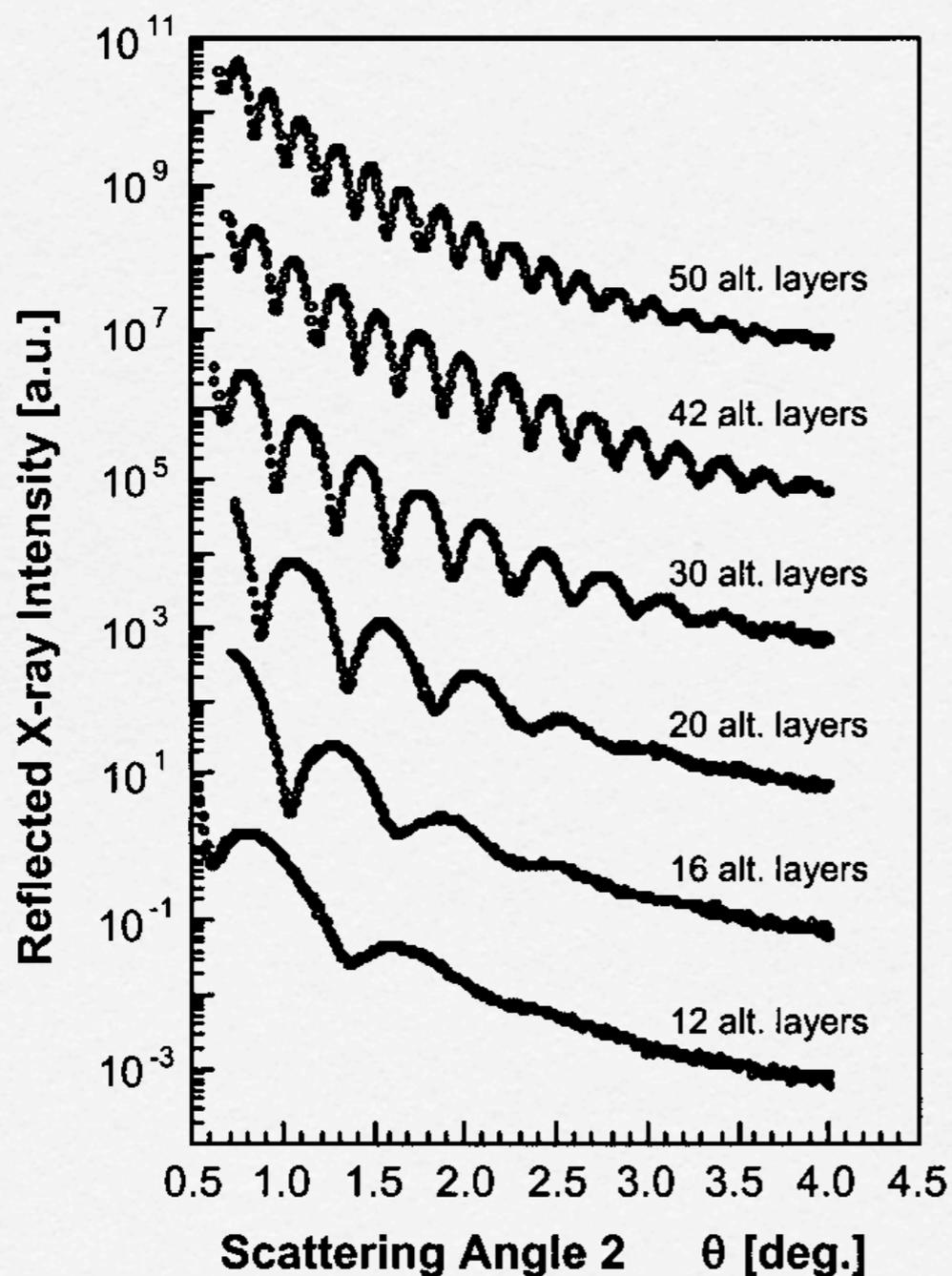
temperature & humidity



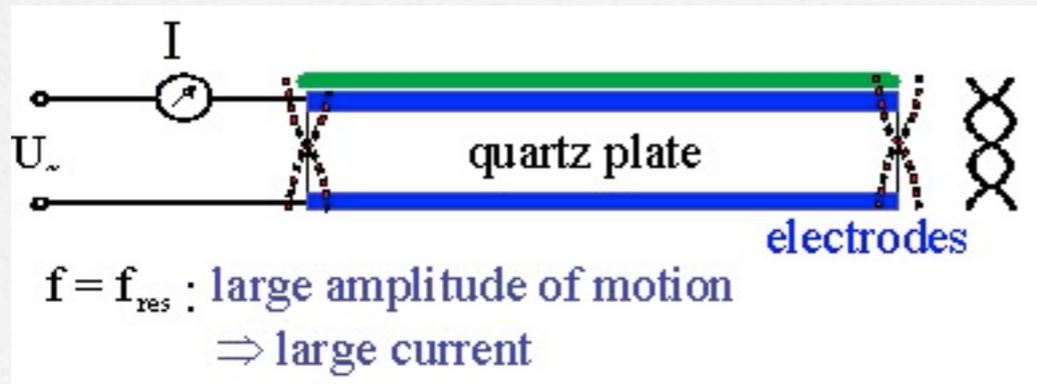
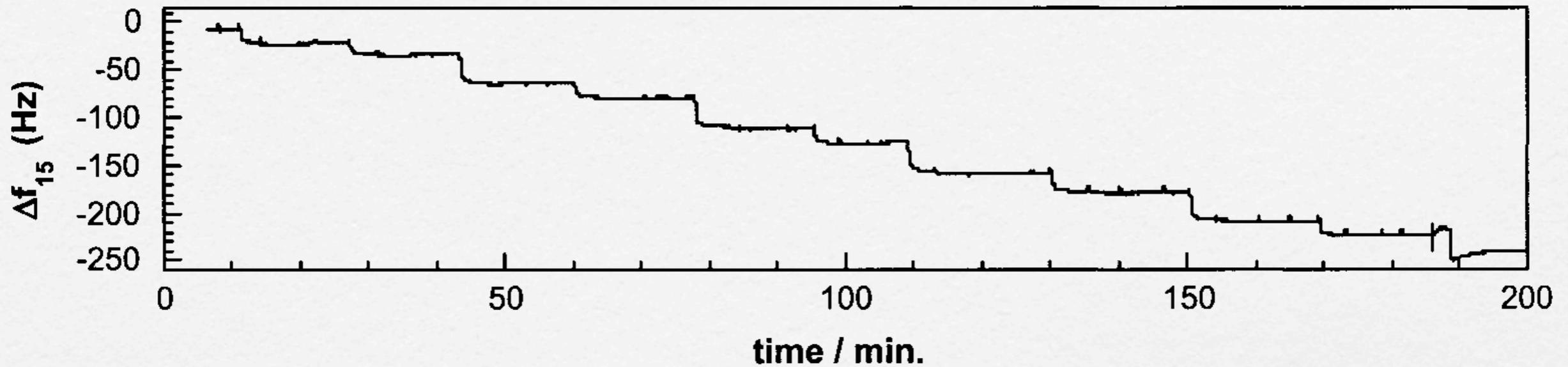
UV/Vis characterization



X-ray reflectometry of multilayer film

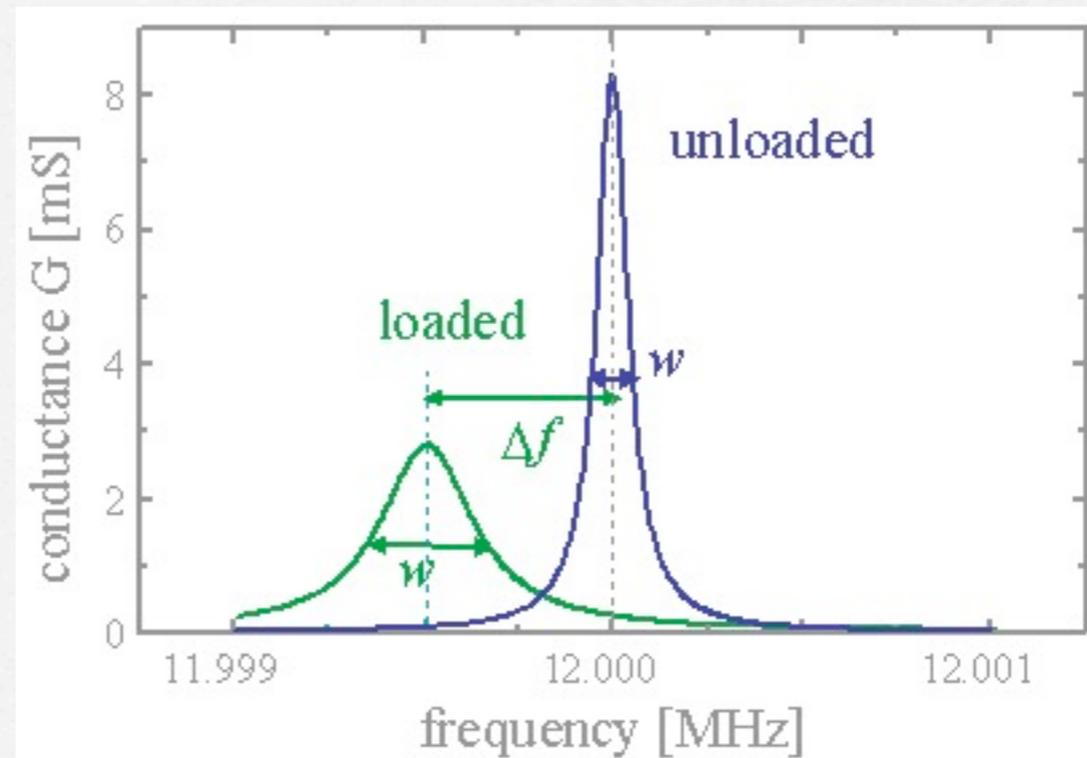


QCM characterization

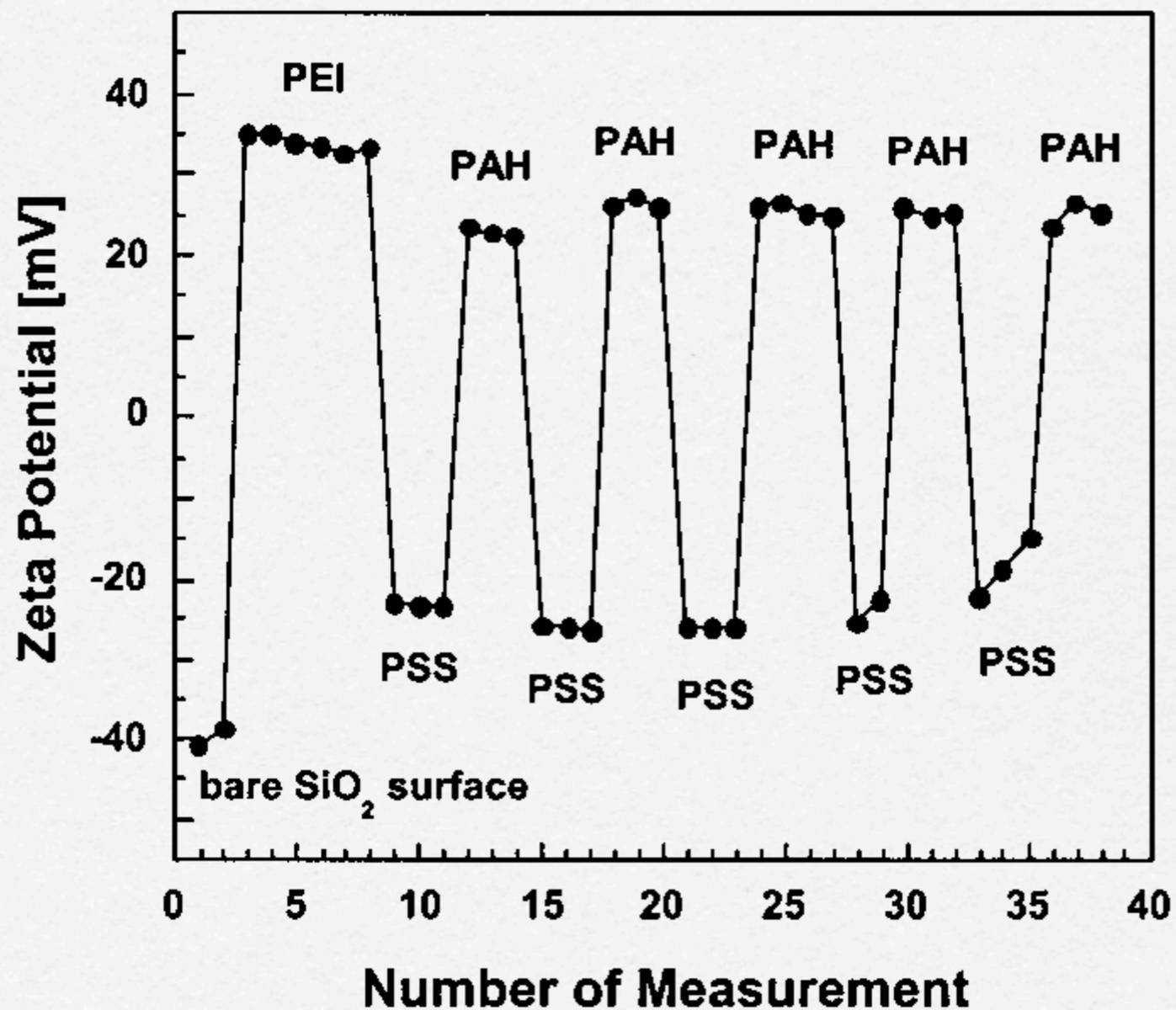


$$\Delta m = -\frac{C \cdot \Delta f}{n}$$

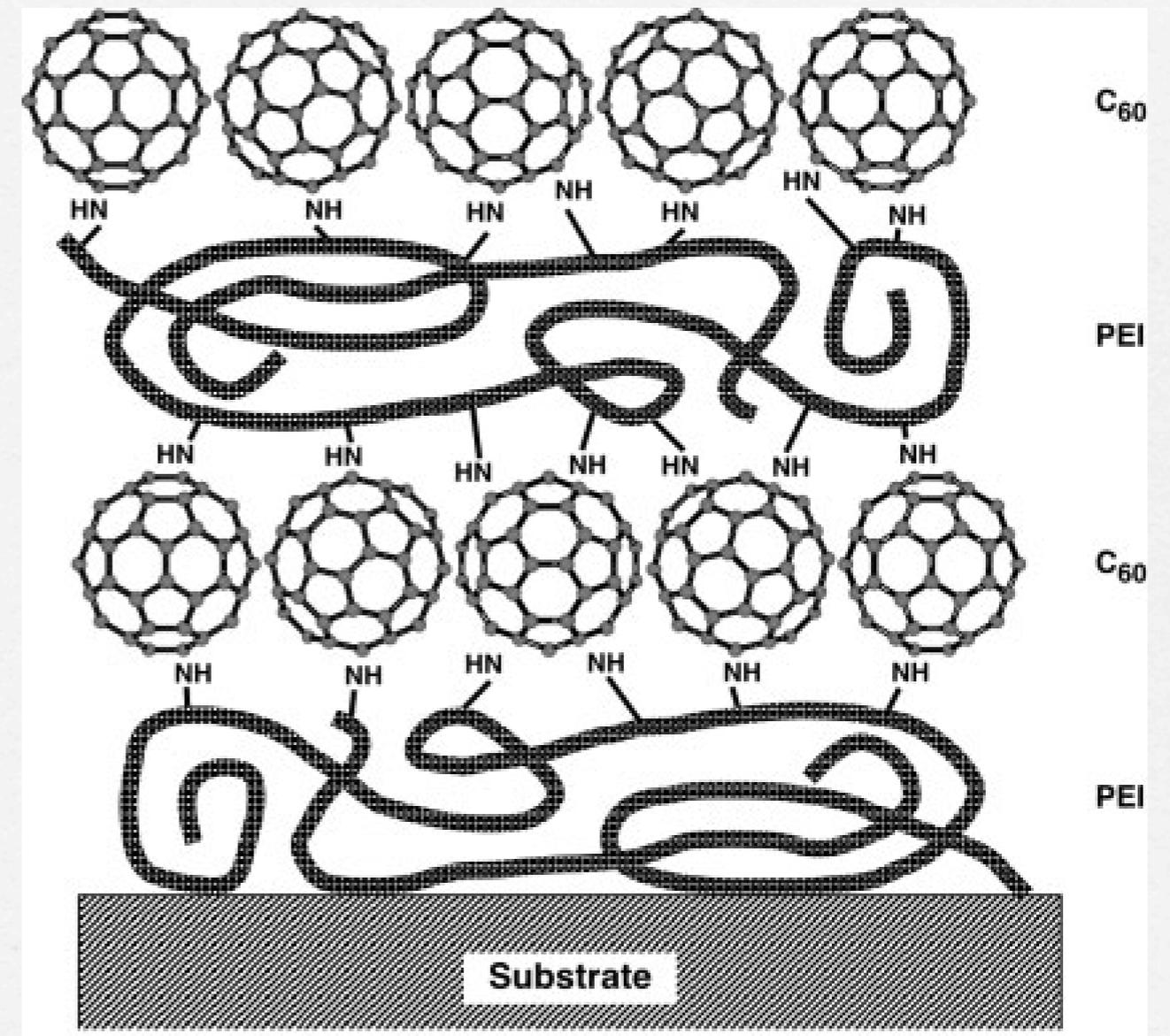
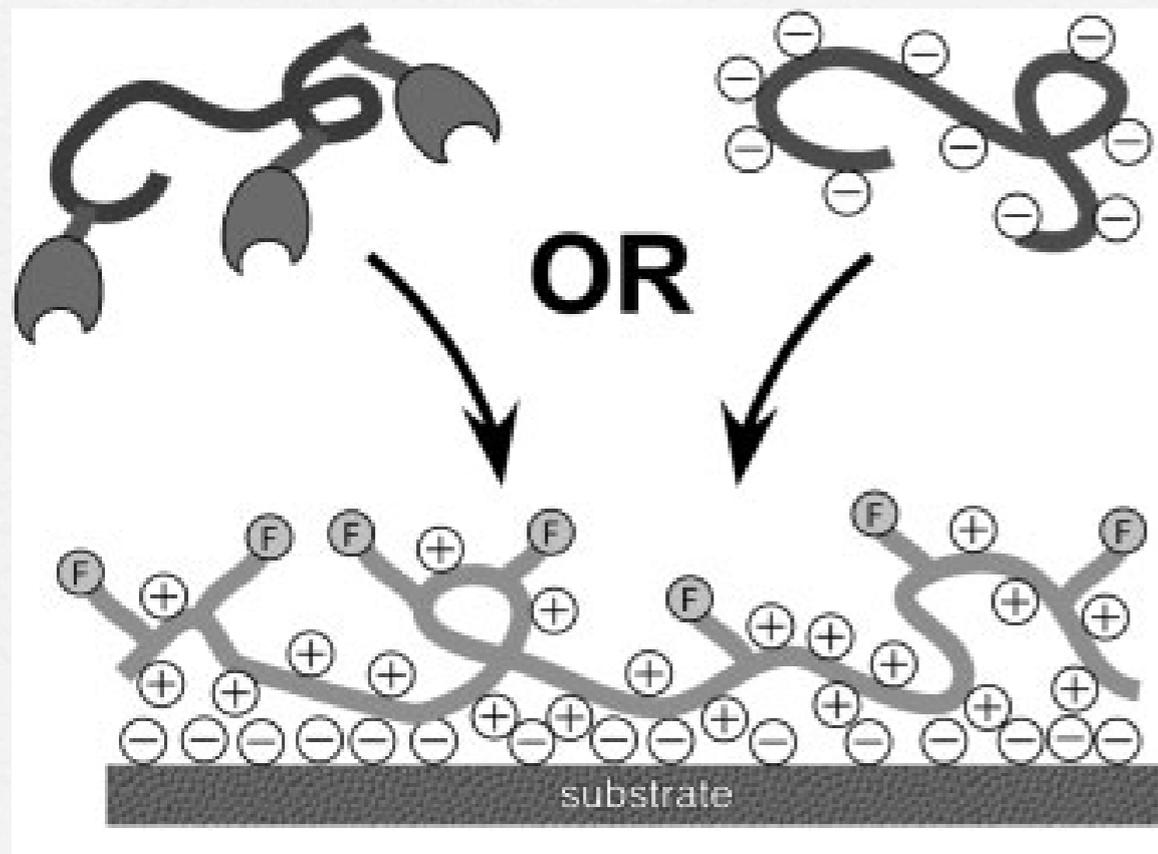
$$d_{\text{eff}} = \frac{\Delta m}{\rho_{\text{eff}}}$$



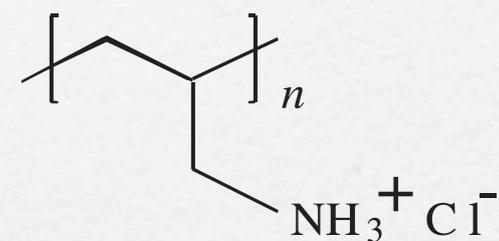
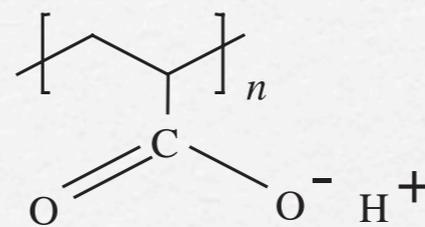
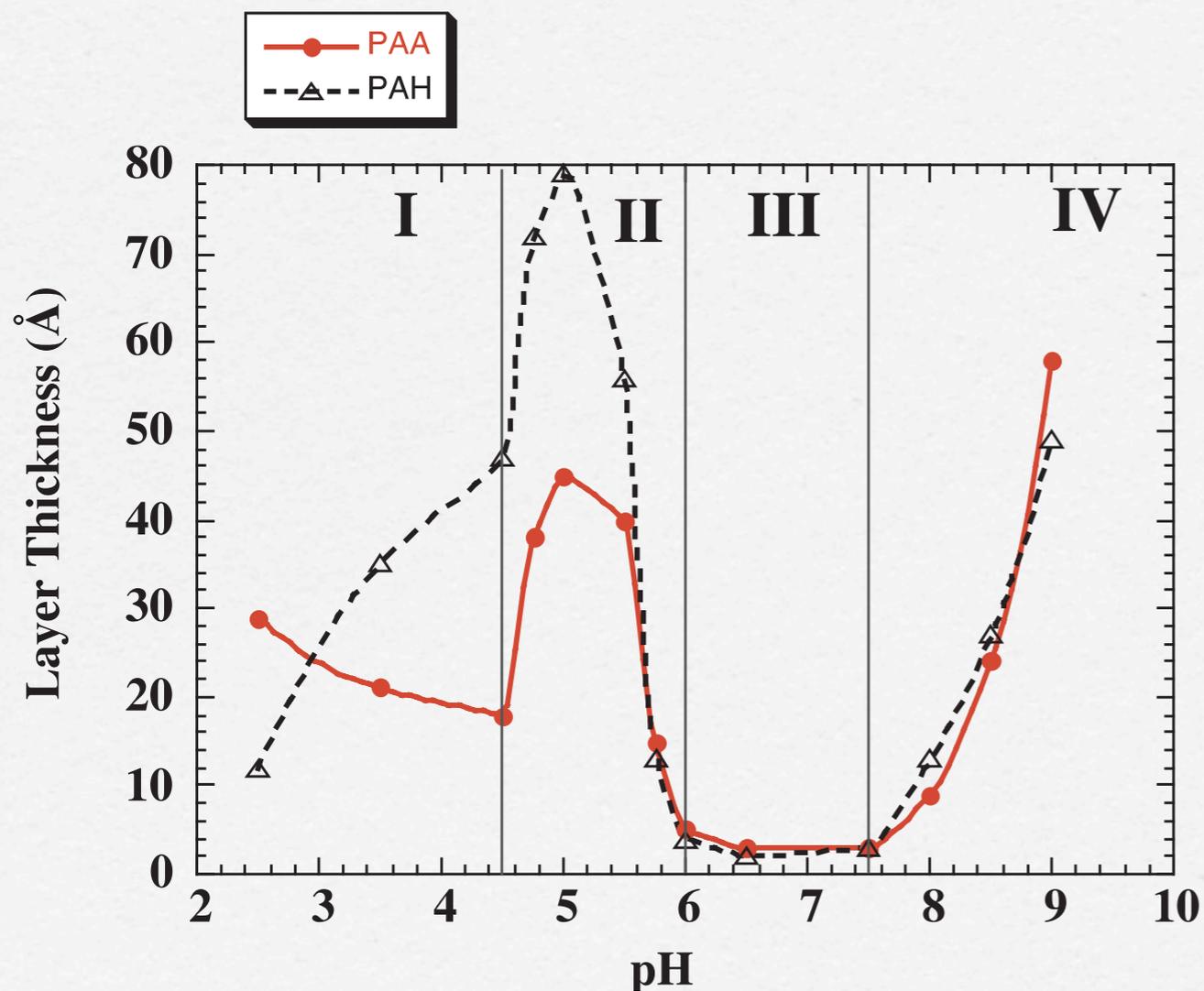
Zeta potential measurement



multimaterials films

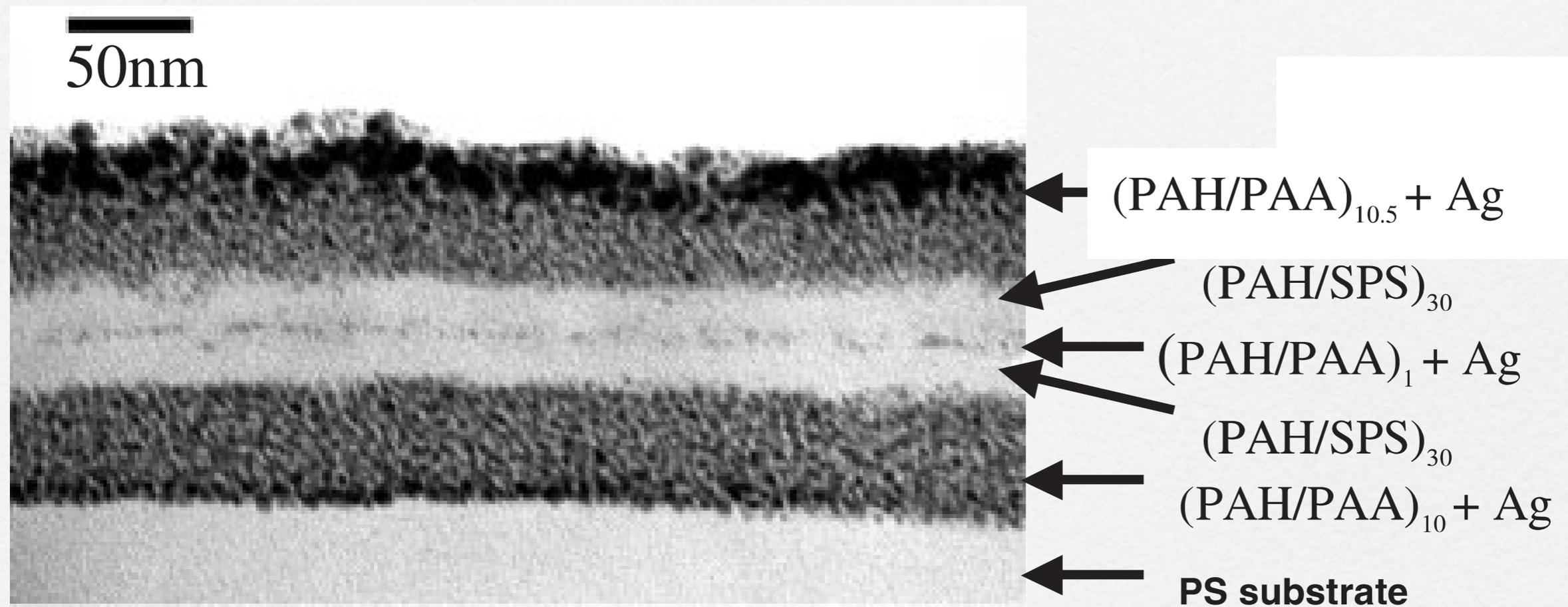


pH control using weak polyelectrolytes



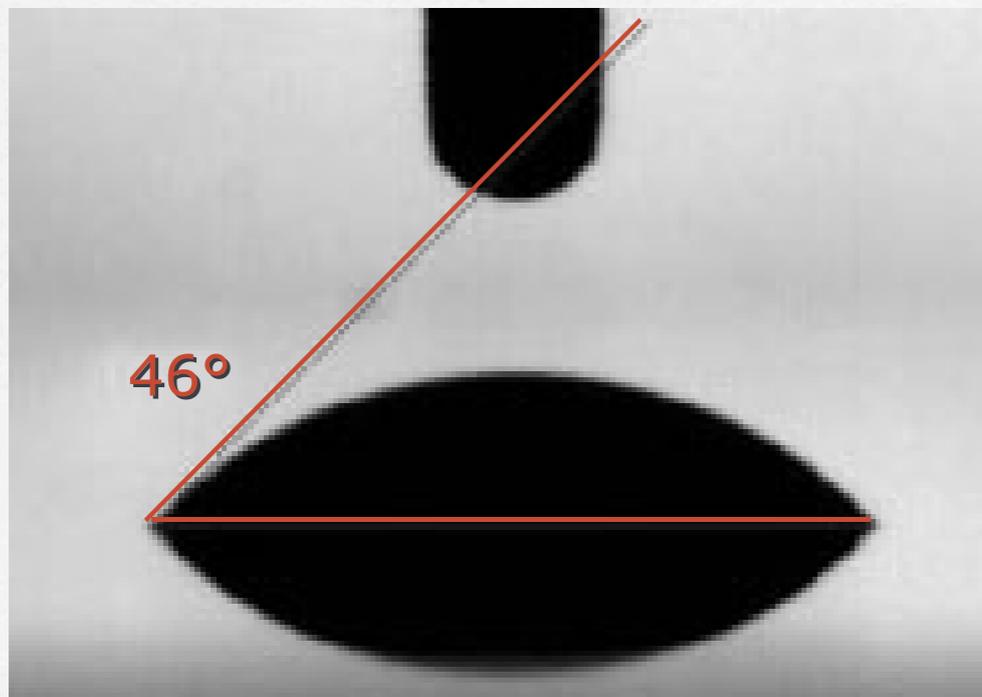
average incremental thickness
contributed by a PAA and PAH adsorbed
layer as a function of solution pH.

particle incorporation in films

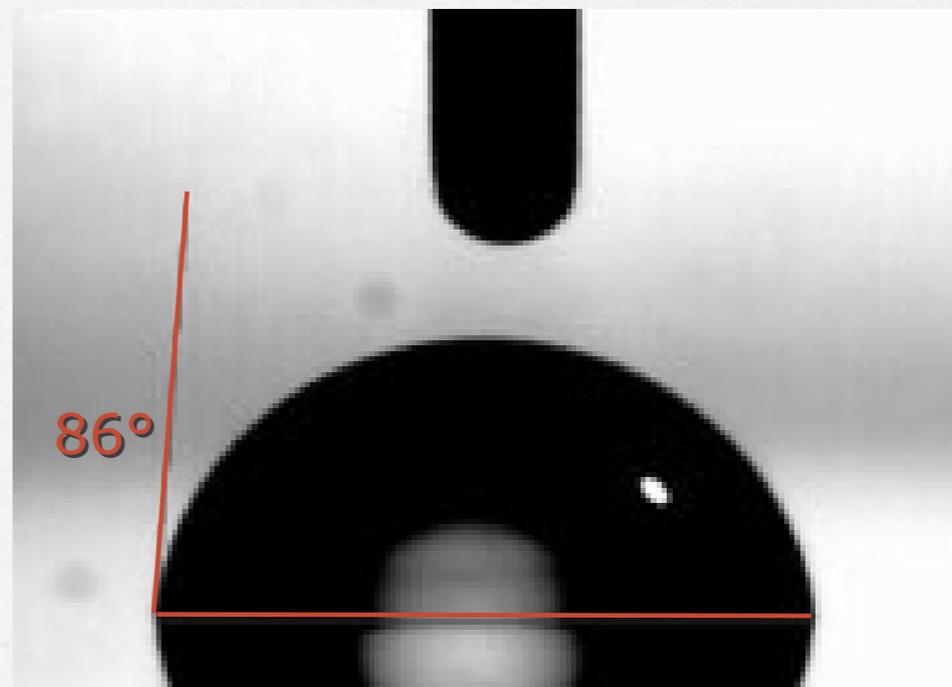


surface functionalization

Images of water droplets on 3.5/7.5 (PAA/PAH)_{7.5} multi-layer films: (a) as-prepared and (b) after immersing the multilayer film into a PS–PAA block copolymer solution.



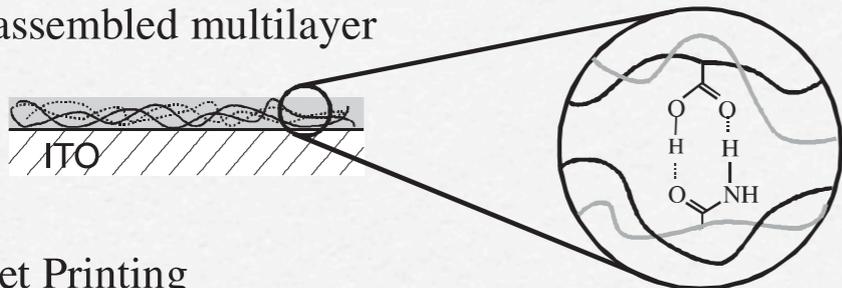
a



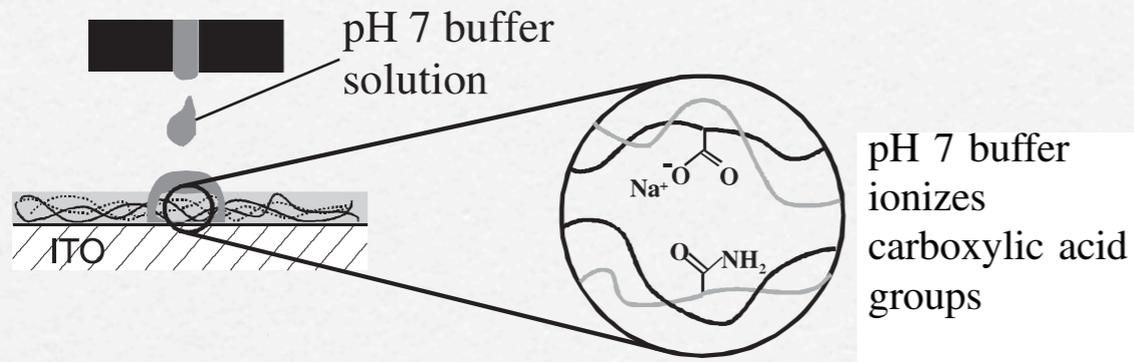
b

patterning of films

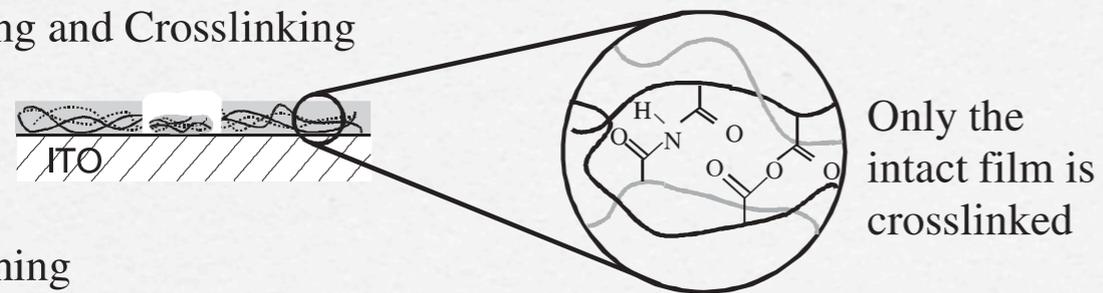
(PAA / PAAm)_n
self-assembled multilayer



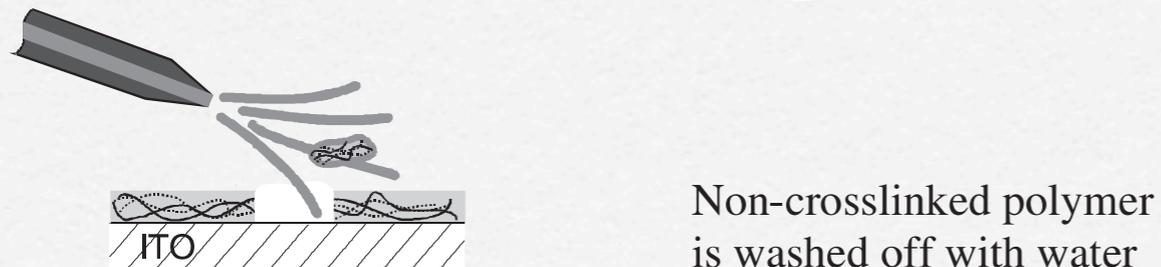
Ink-jet Printing



Drying and Crosslinking



Washing



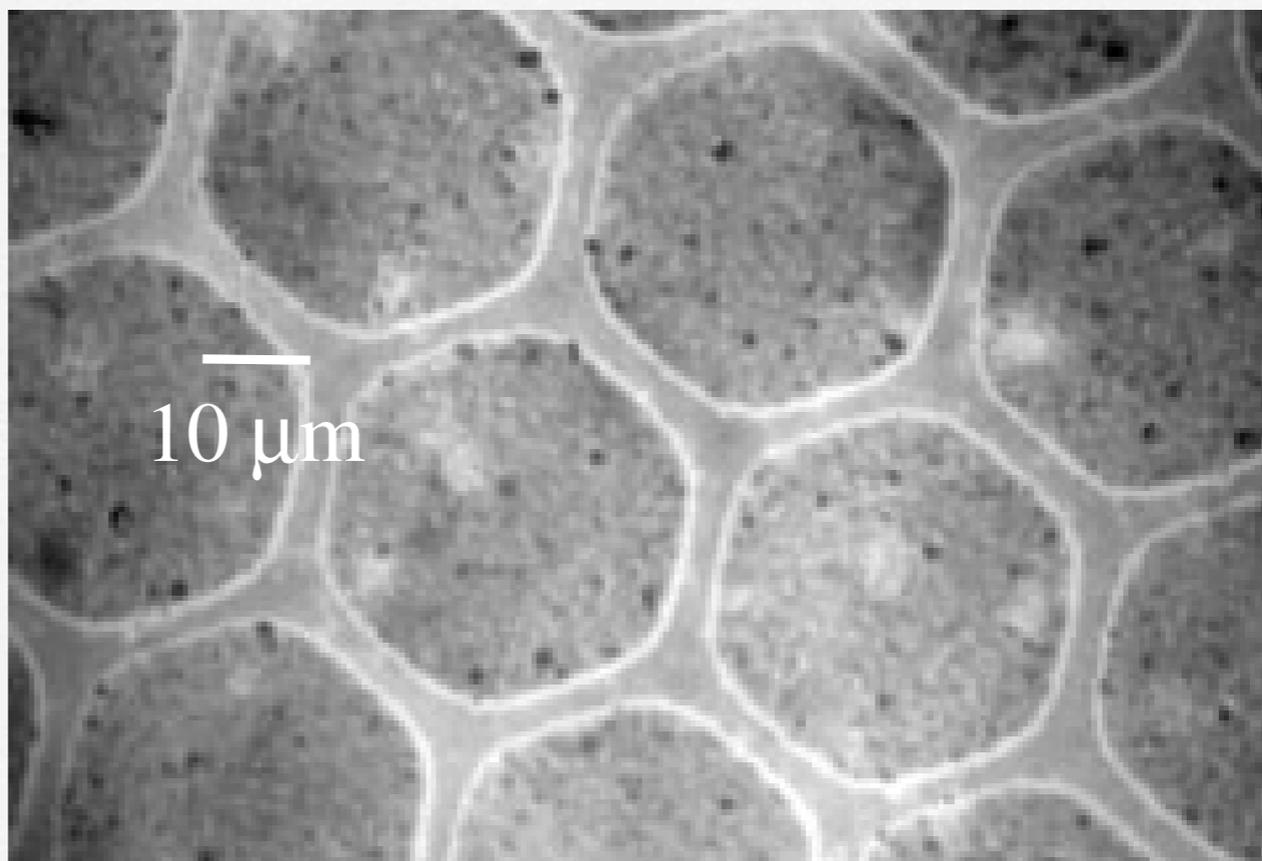
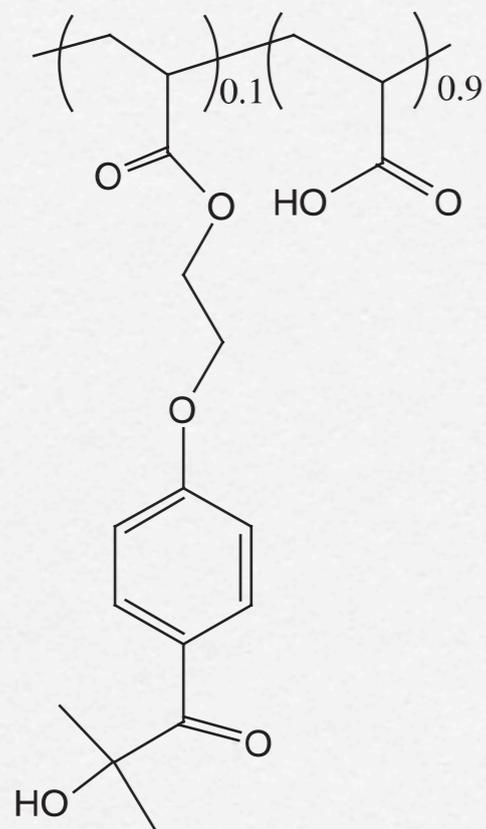
Patterned Film



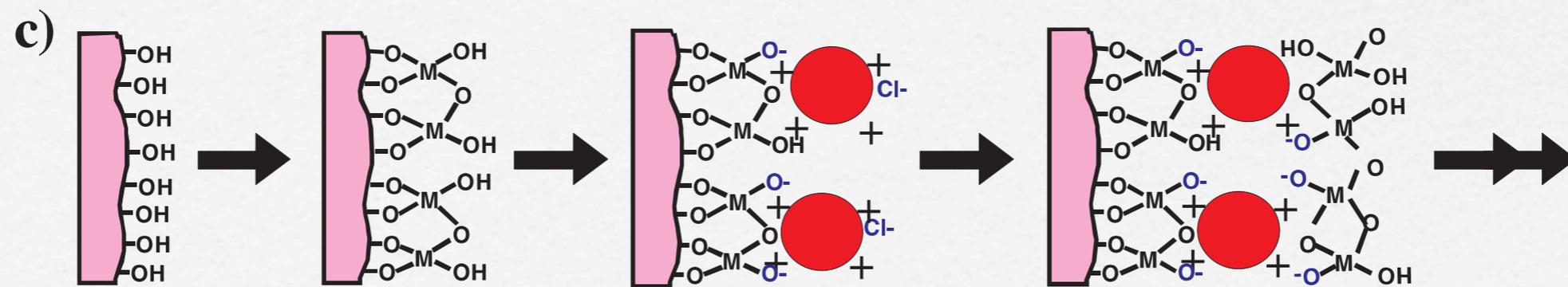
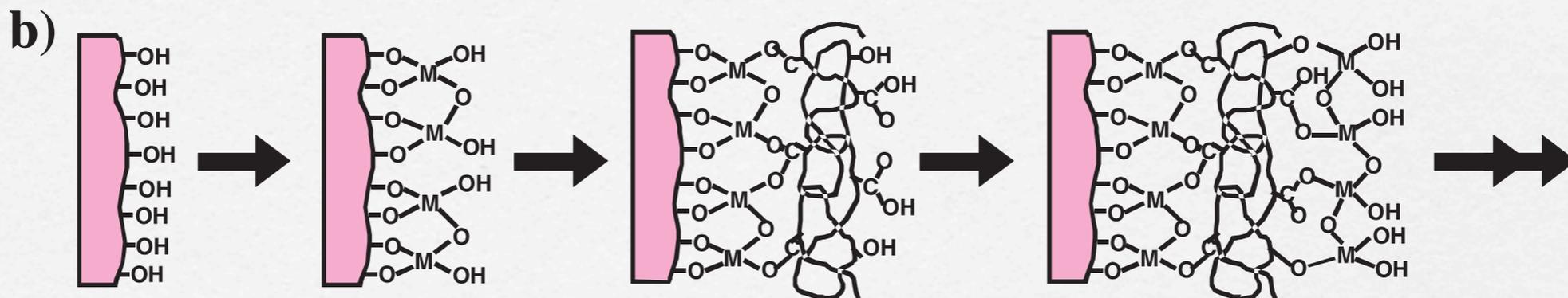
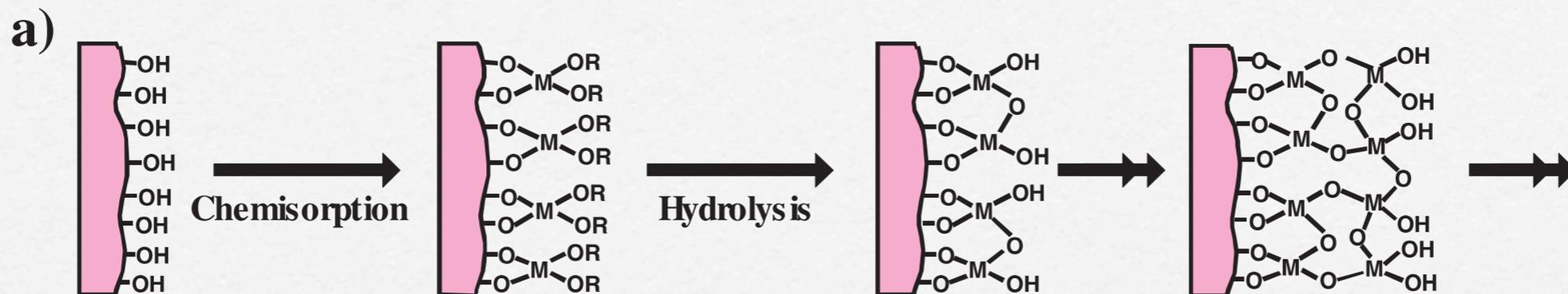
LED



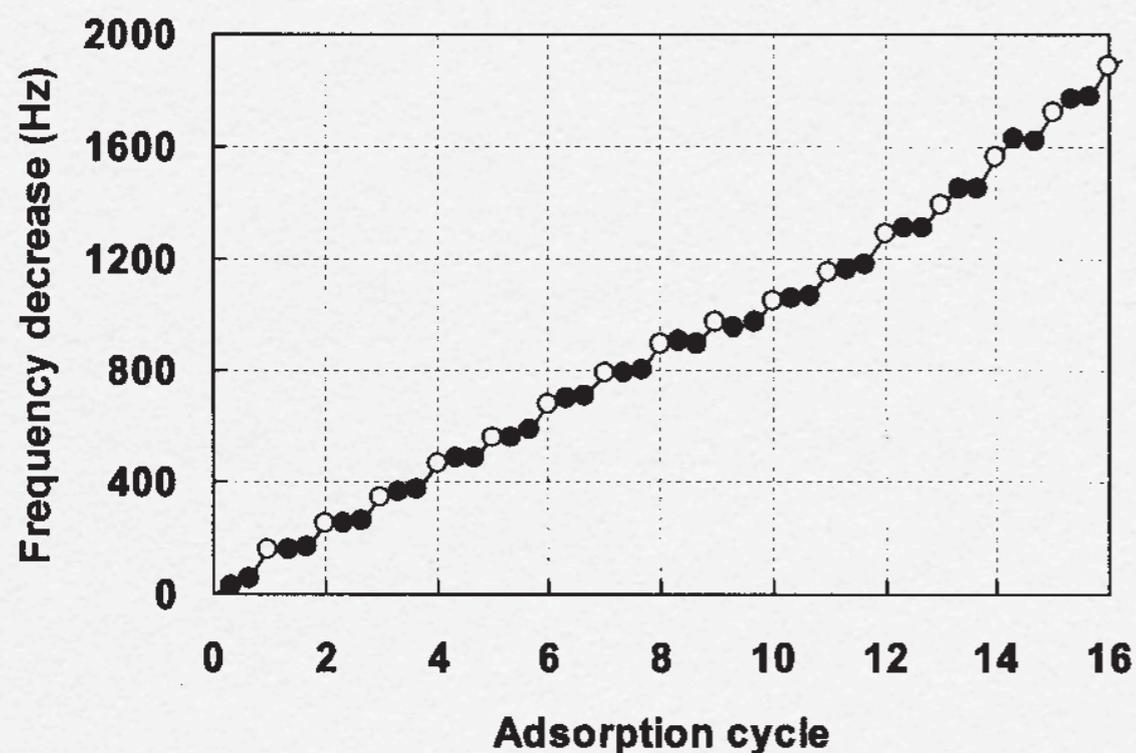
patterning of films



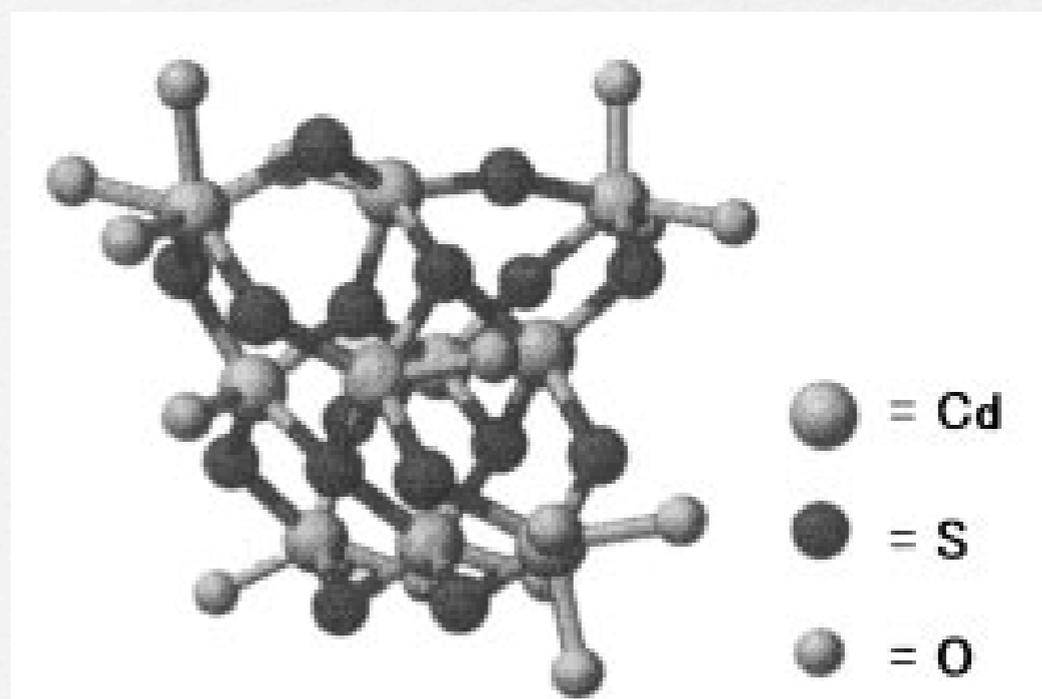
LbL of metal alkoxides



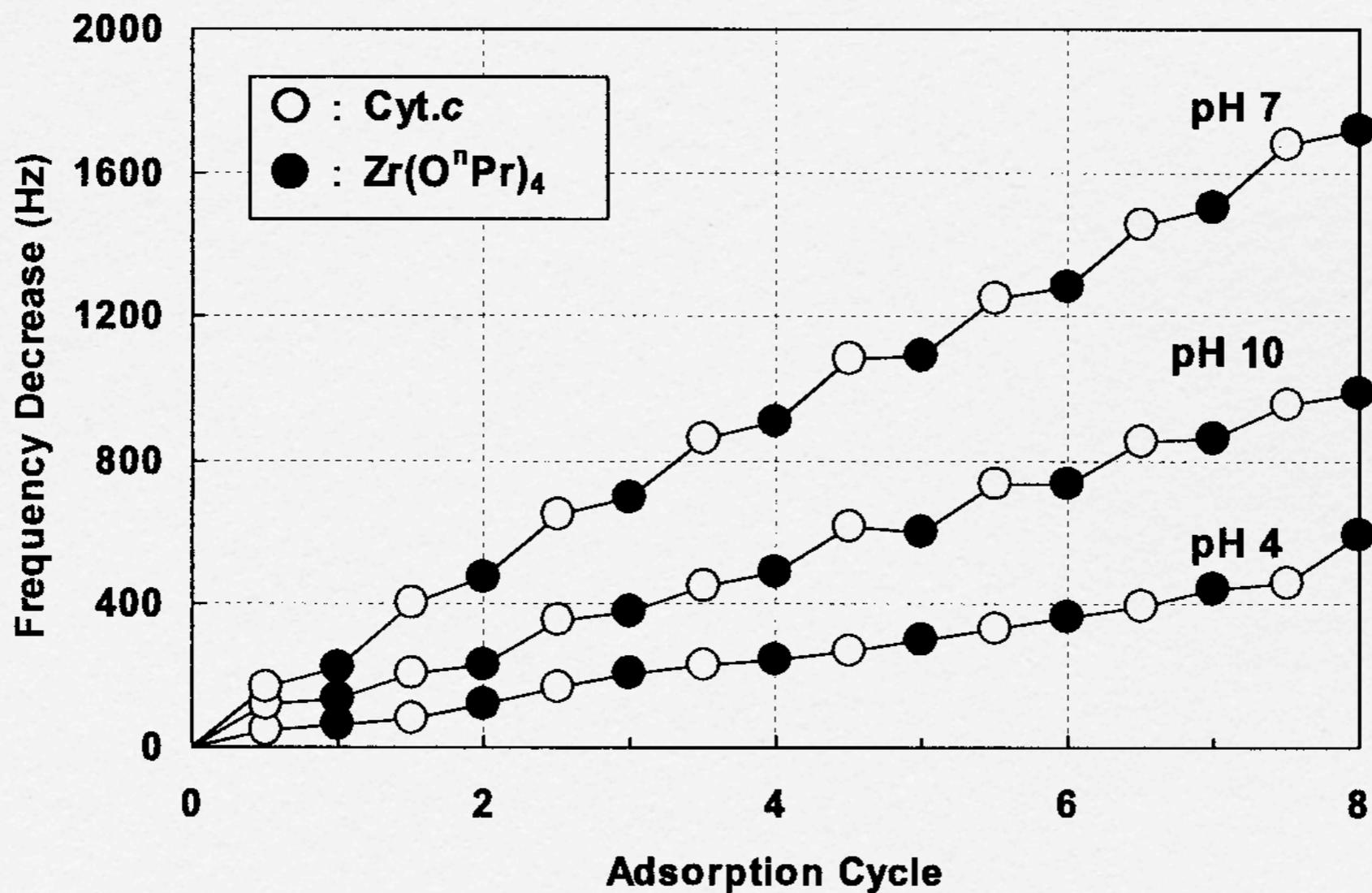
LbL of metal alkoxides



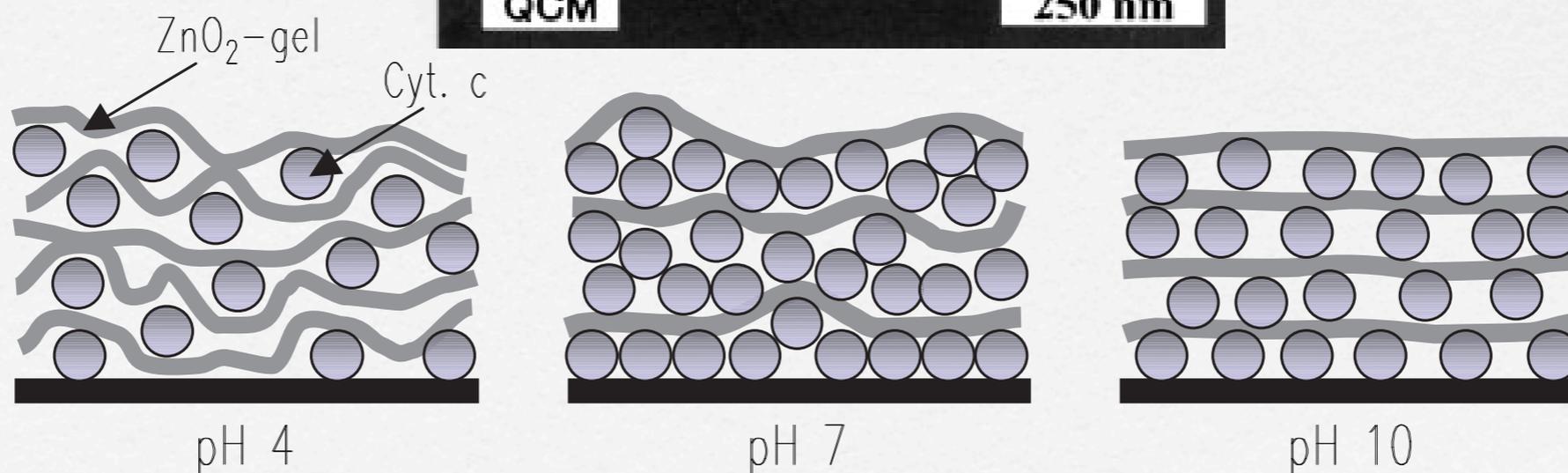
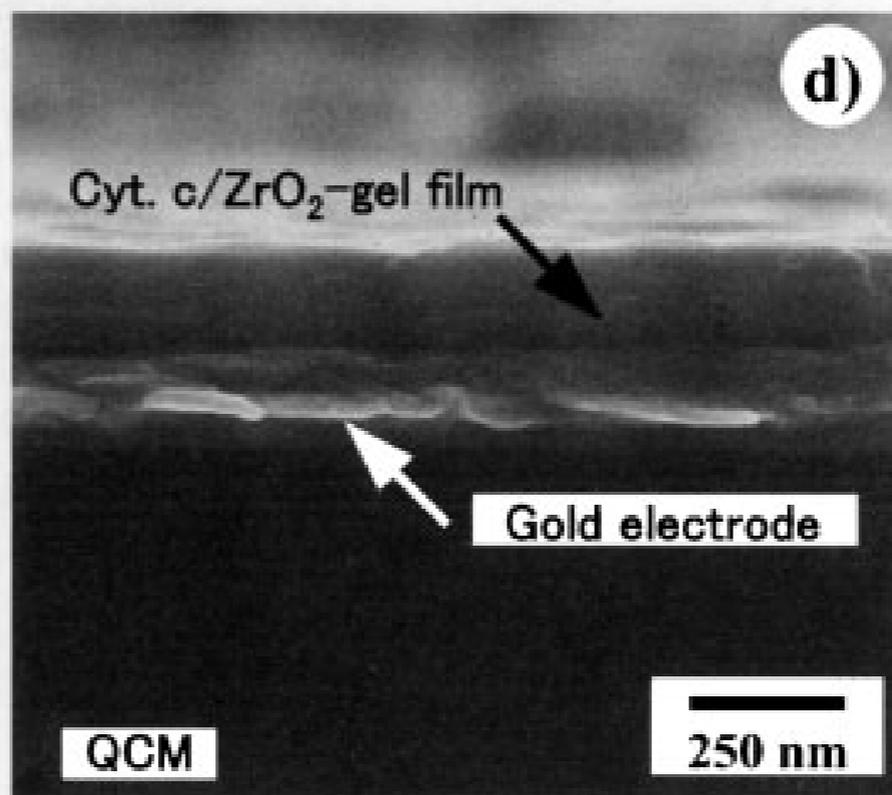
alternate adsorption of $\text{Ti}(\text{OnBu})_4$ and cadmium polynuclear complex ($[\text{Cd}_{10}(\text{SCH}_2\text{CH}_2\text{OH})_{16}]^{4+} \cdot 4\text{ClO}_4$).



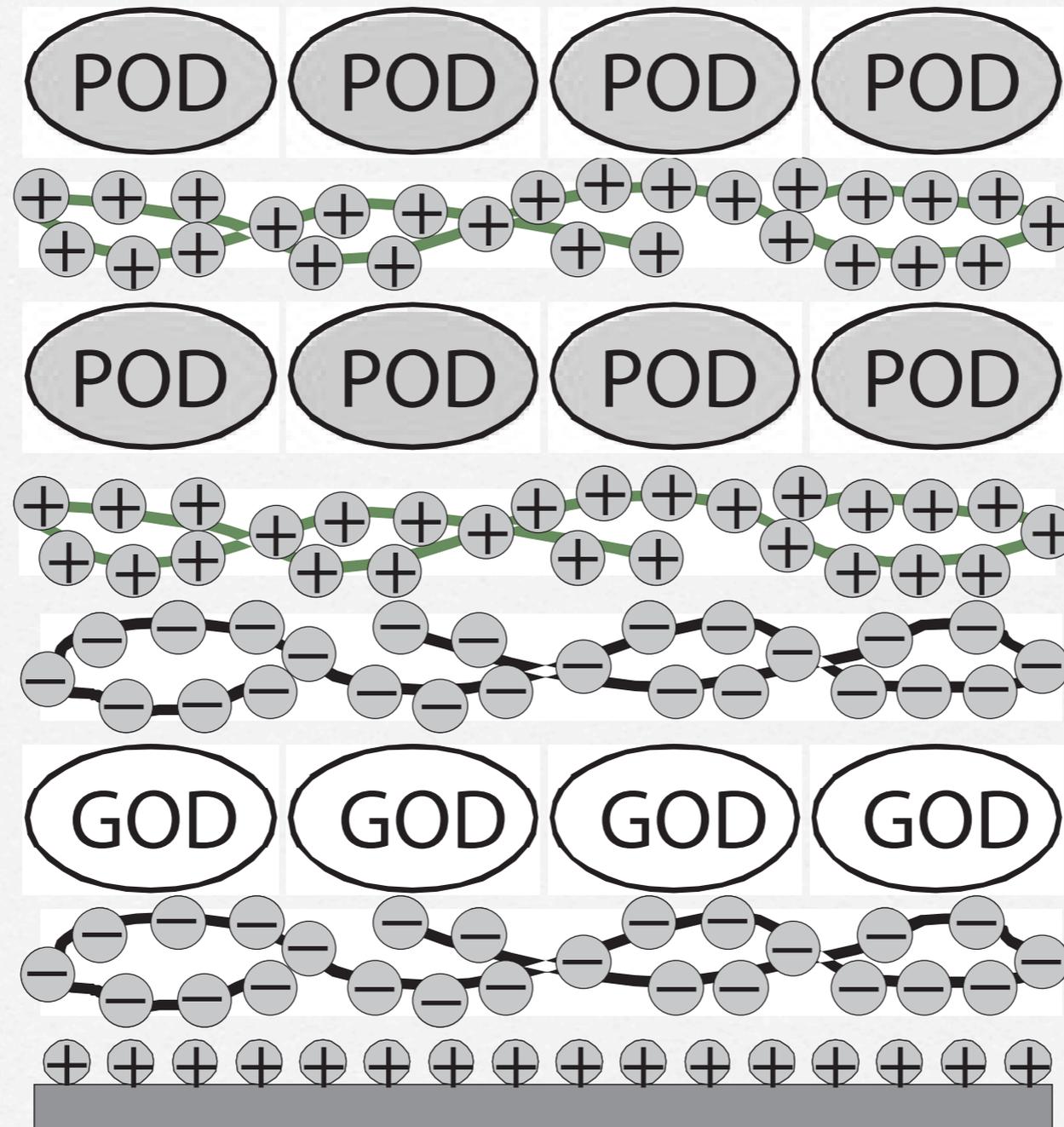
Multilayer Assembly of Metal Oxides and Proteins



Multilayer Assembly of Metal Oxides and Proteins

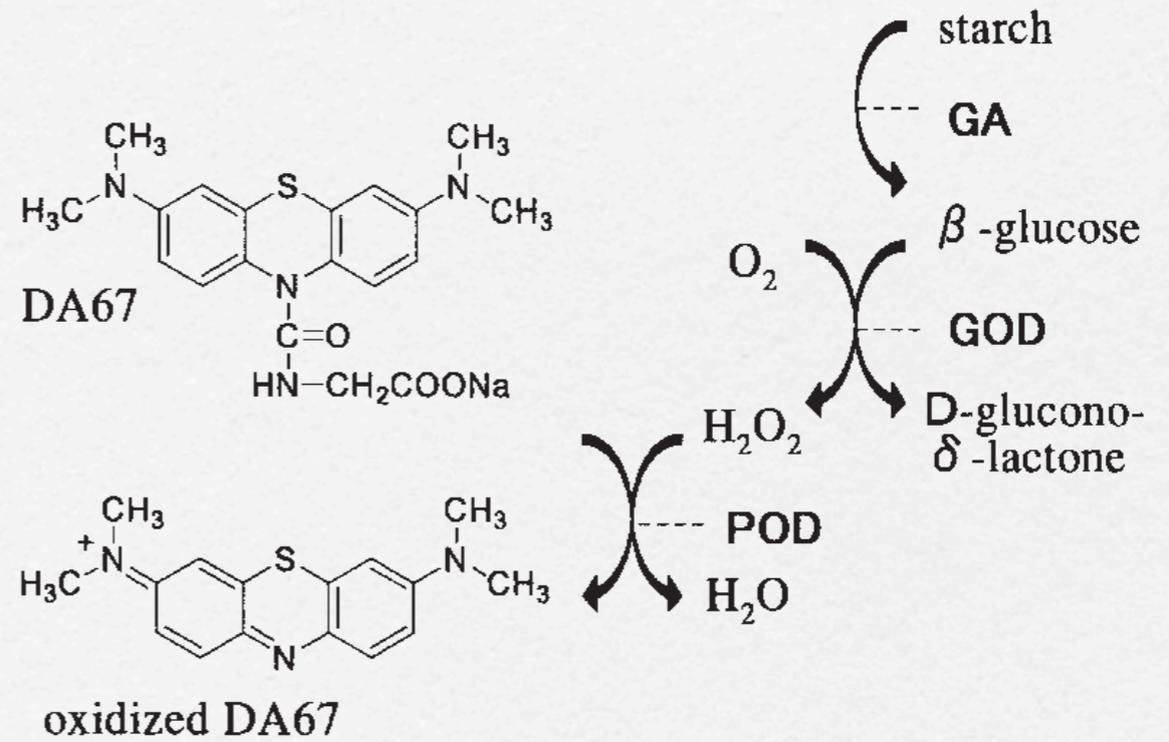
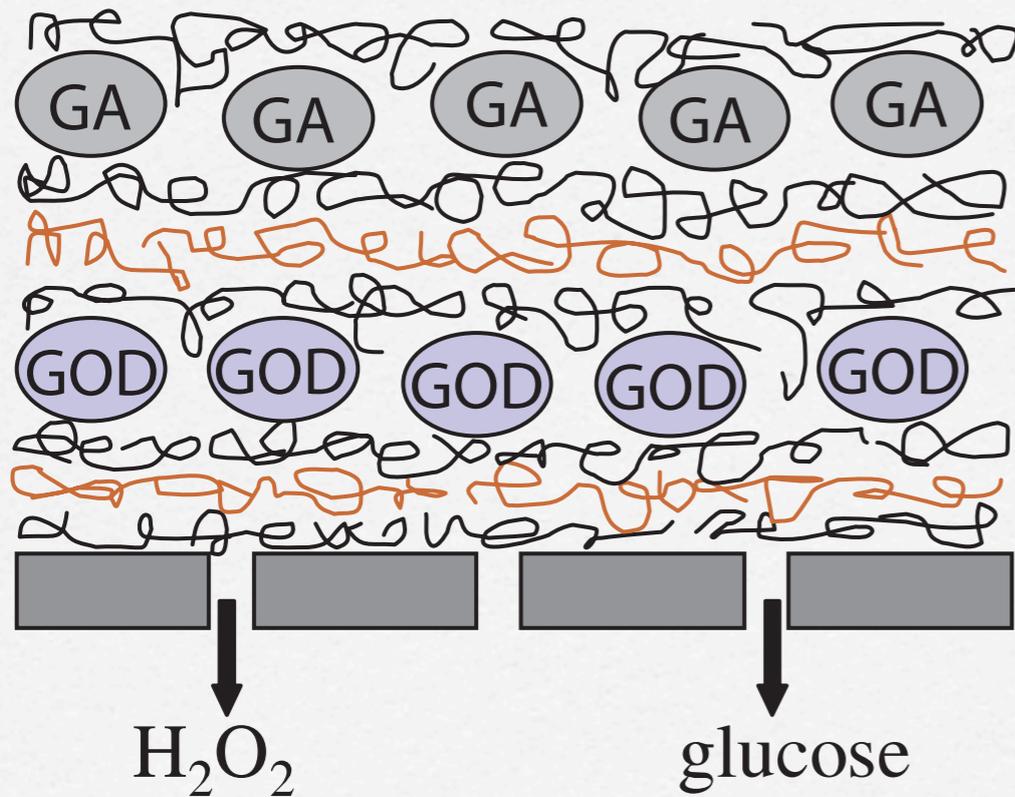


protein/polymer multilayer

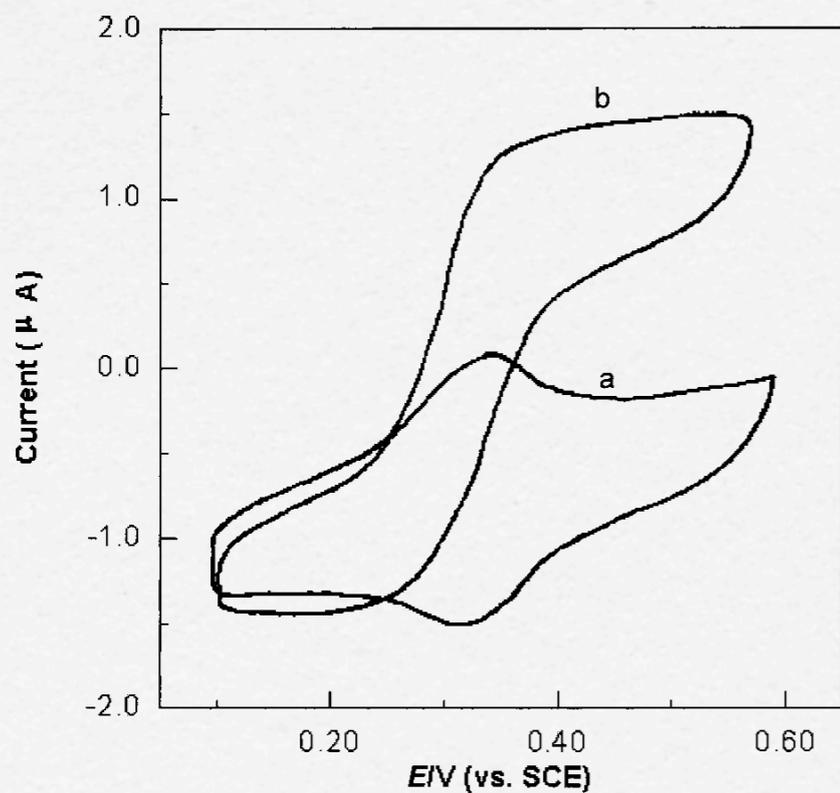
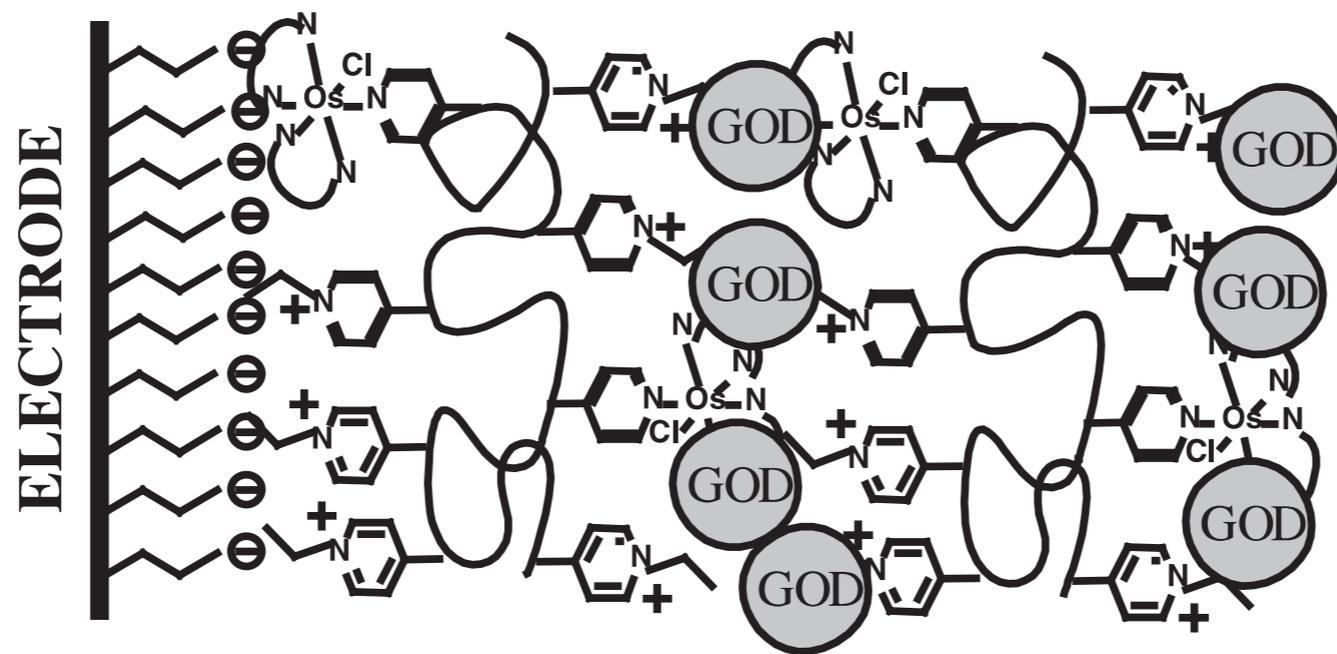


Bioreactors

starch

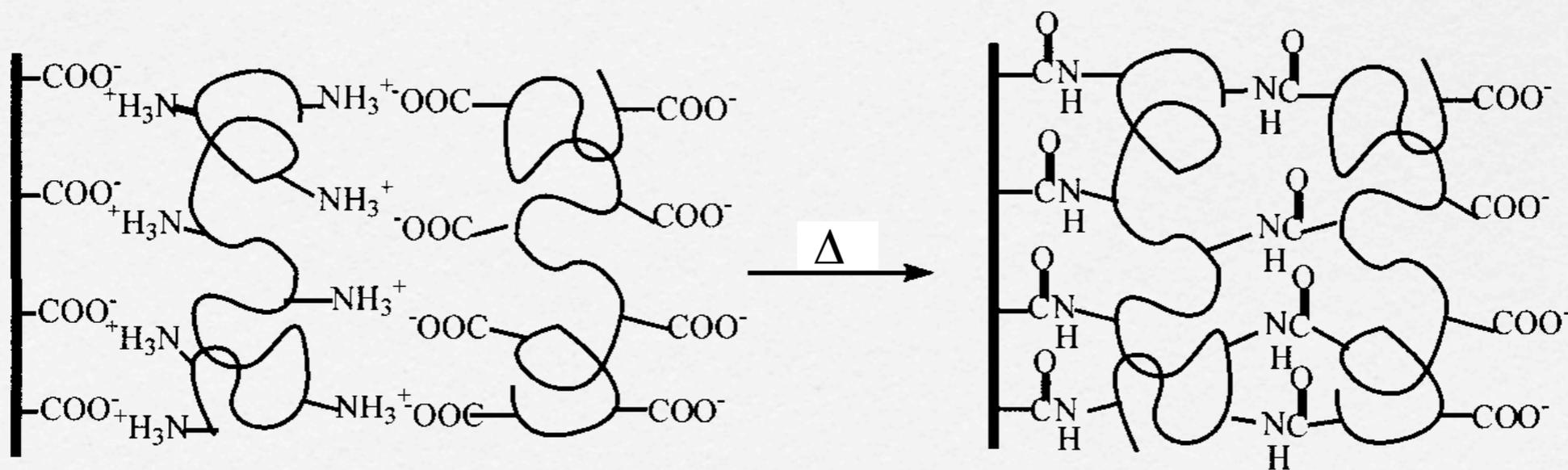
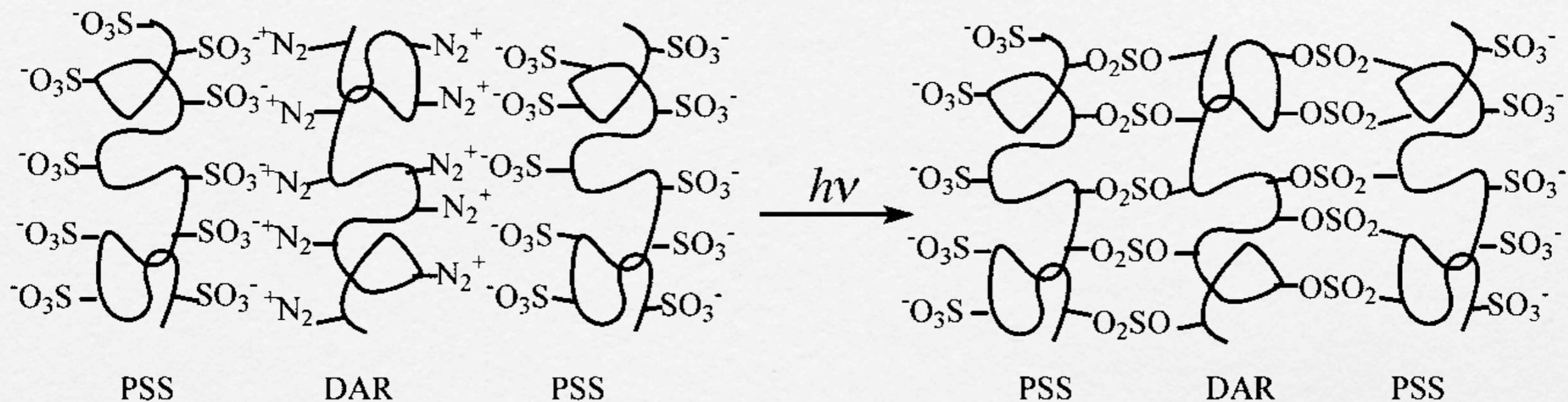


Glucose oxidase films

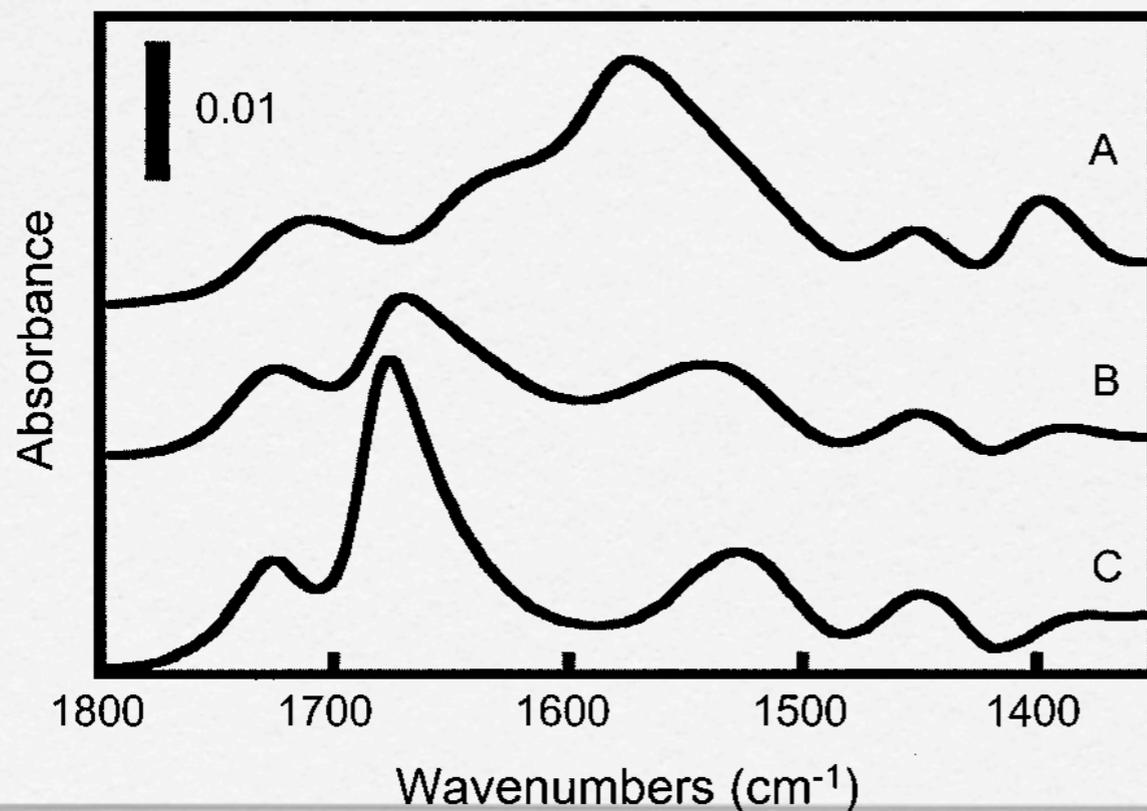
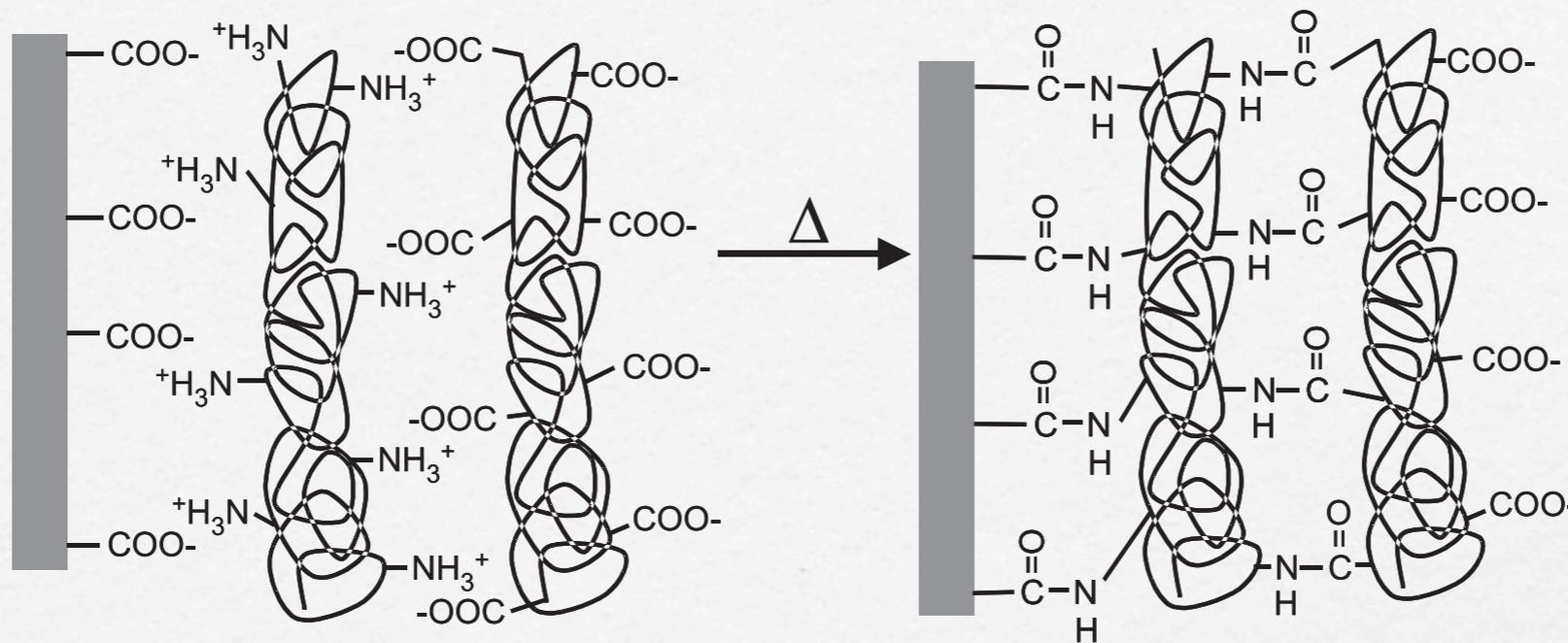


(a) without glucose
(b) in the presence of glucose

cross-linking of films



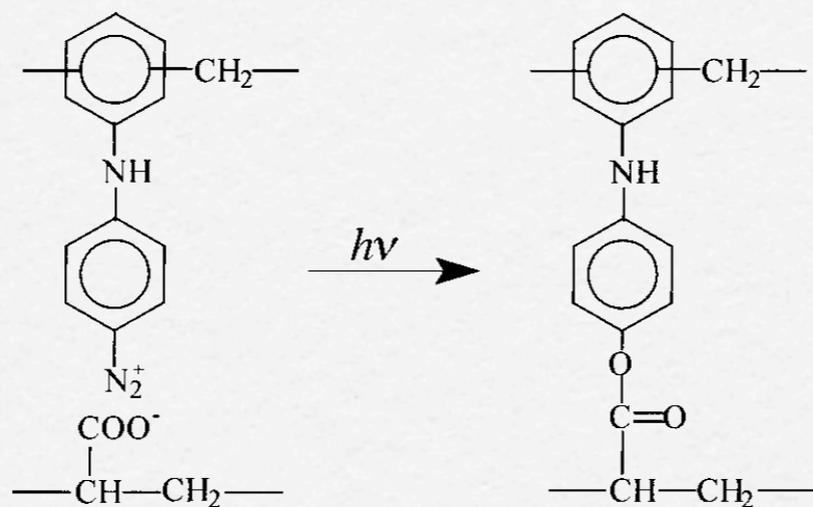
cross-linking of films



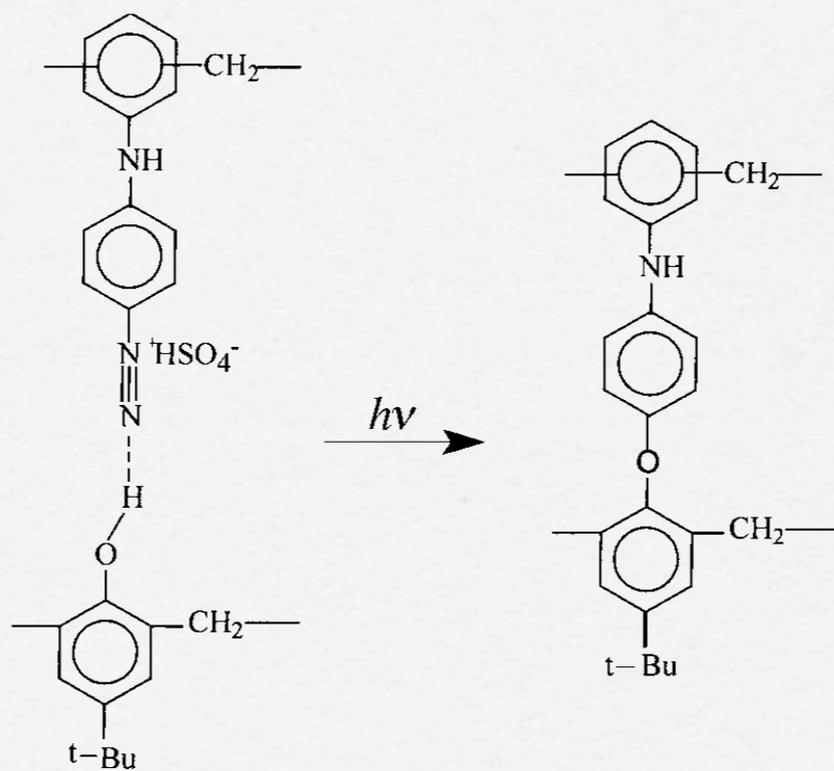
Reflectance FTIR spectra of nine-bilayer PAH/PAA films before heating (A) and after heating for 2 h at 130°C (B) or 215°C (C).

cross-linking of films

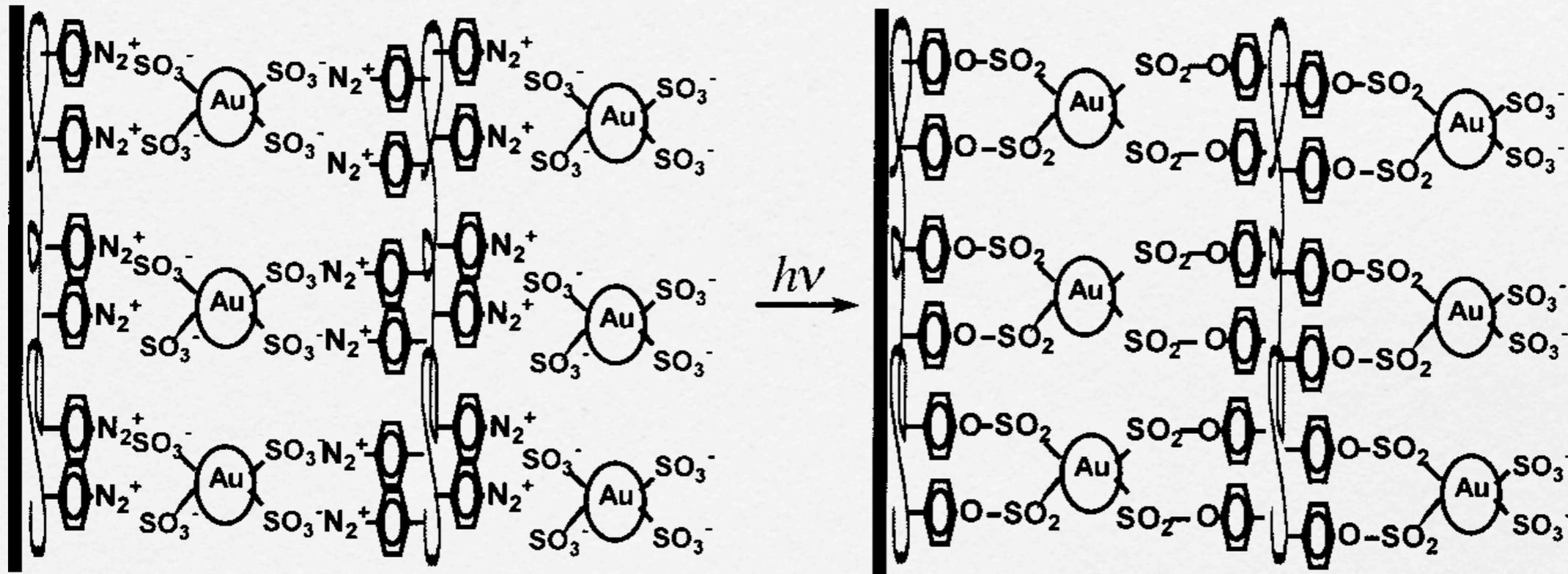
A



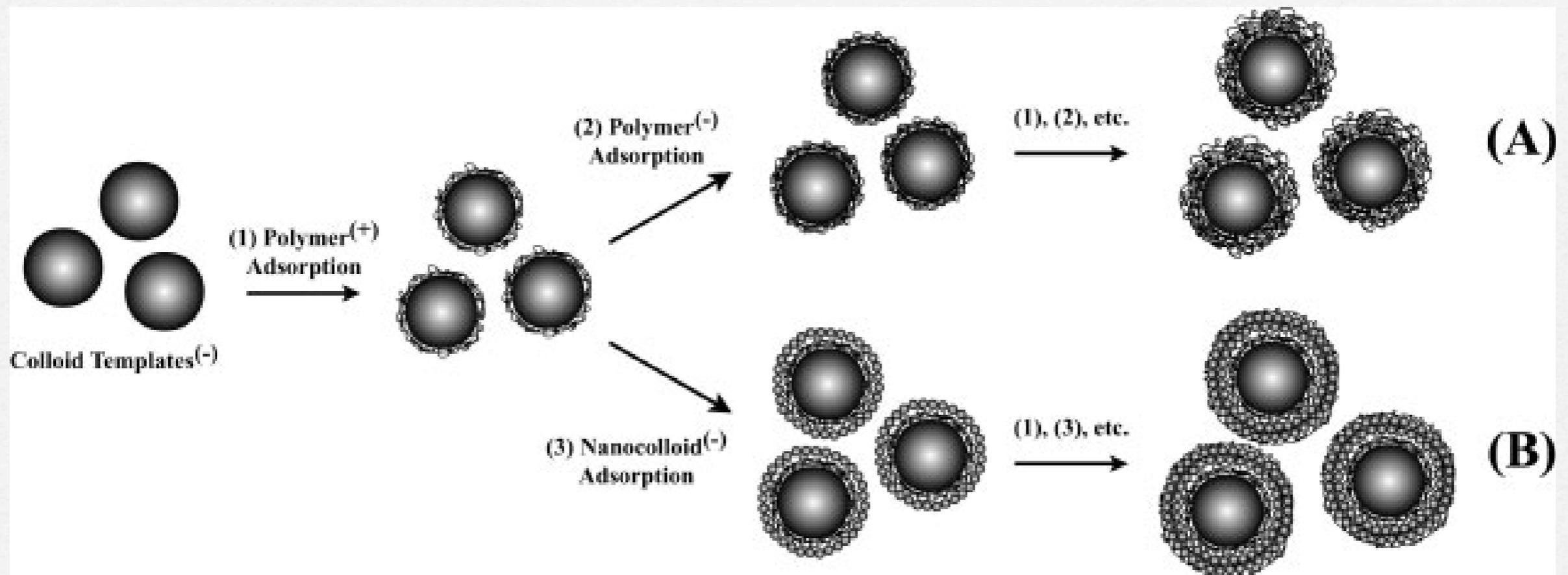
B



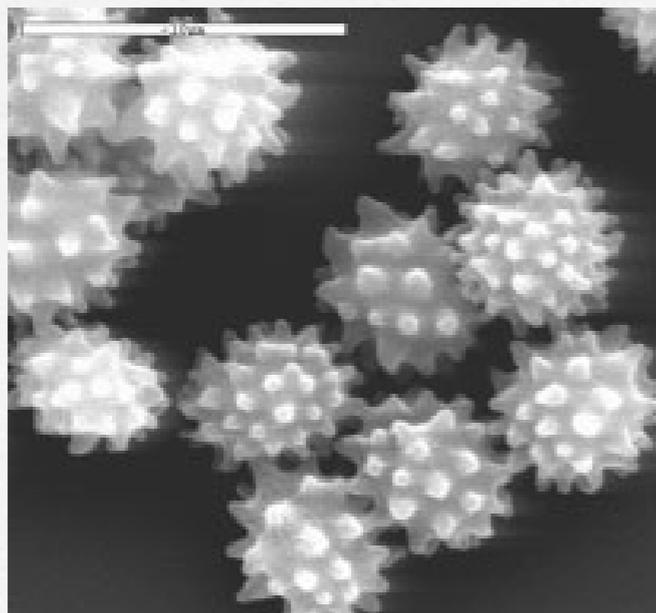
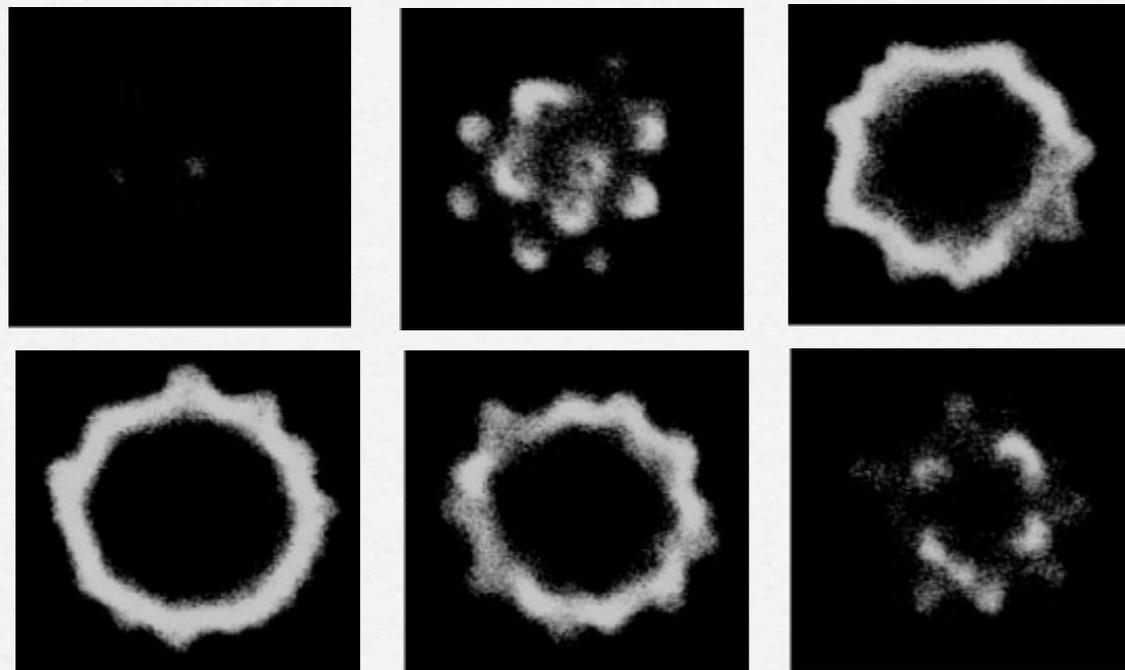
cross-linking of films



Coated Colloids

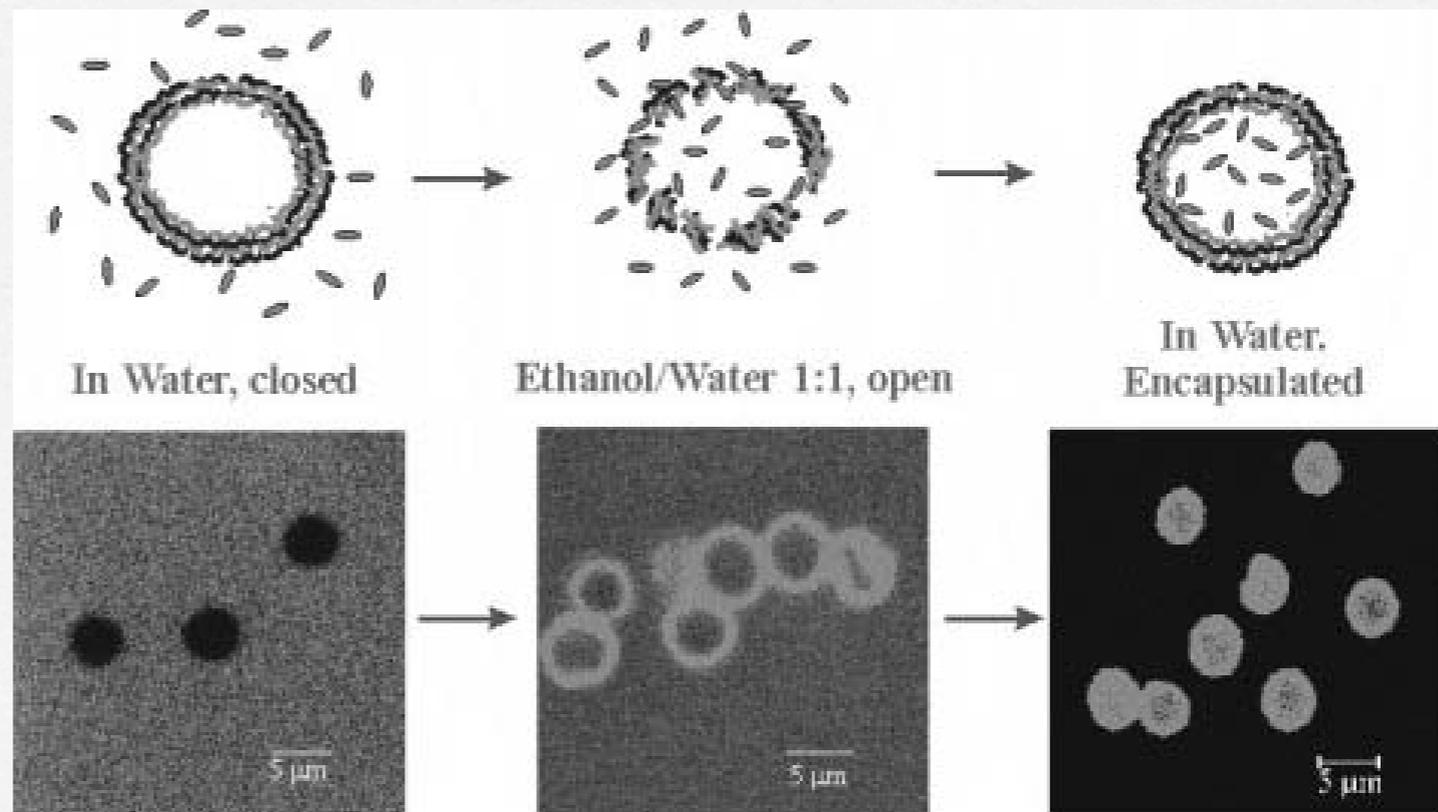
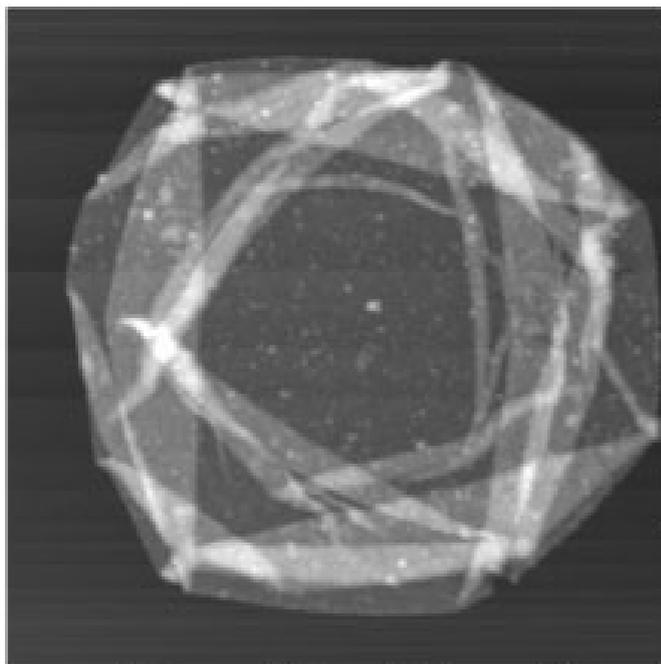
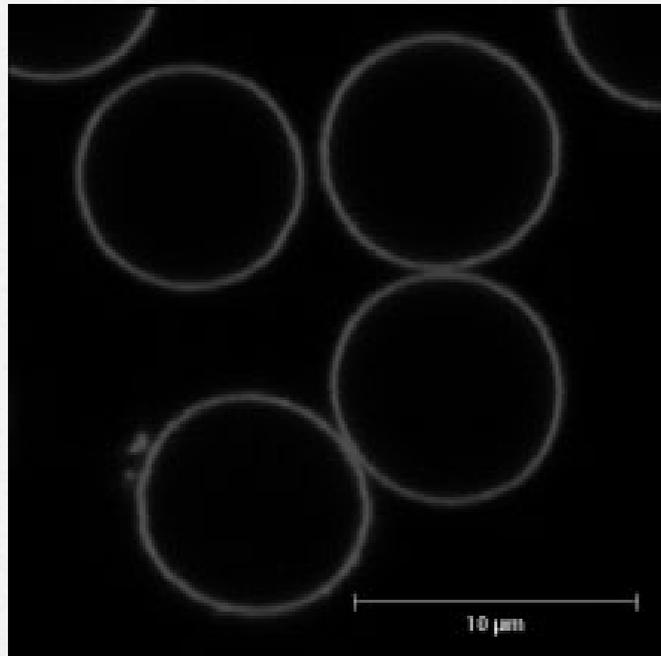


Coated Colloids



polyelectrolyte shell consisting of 11 layers of PSS/PAH templated on an echinocyte. The outer layer is FITC labelled PAH.

hollow capsules



more ...

