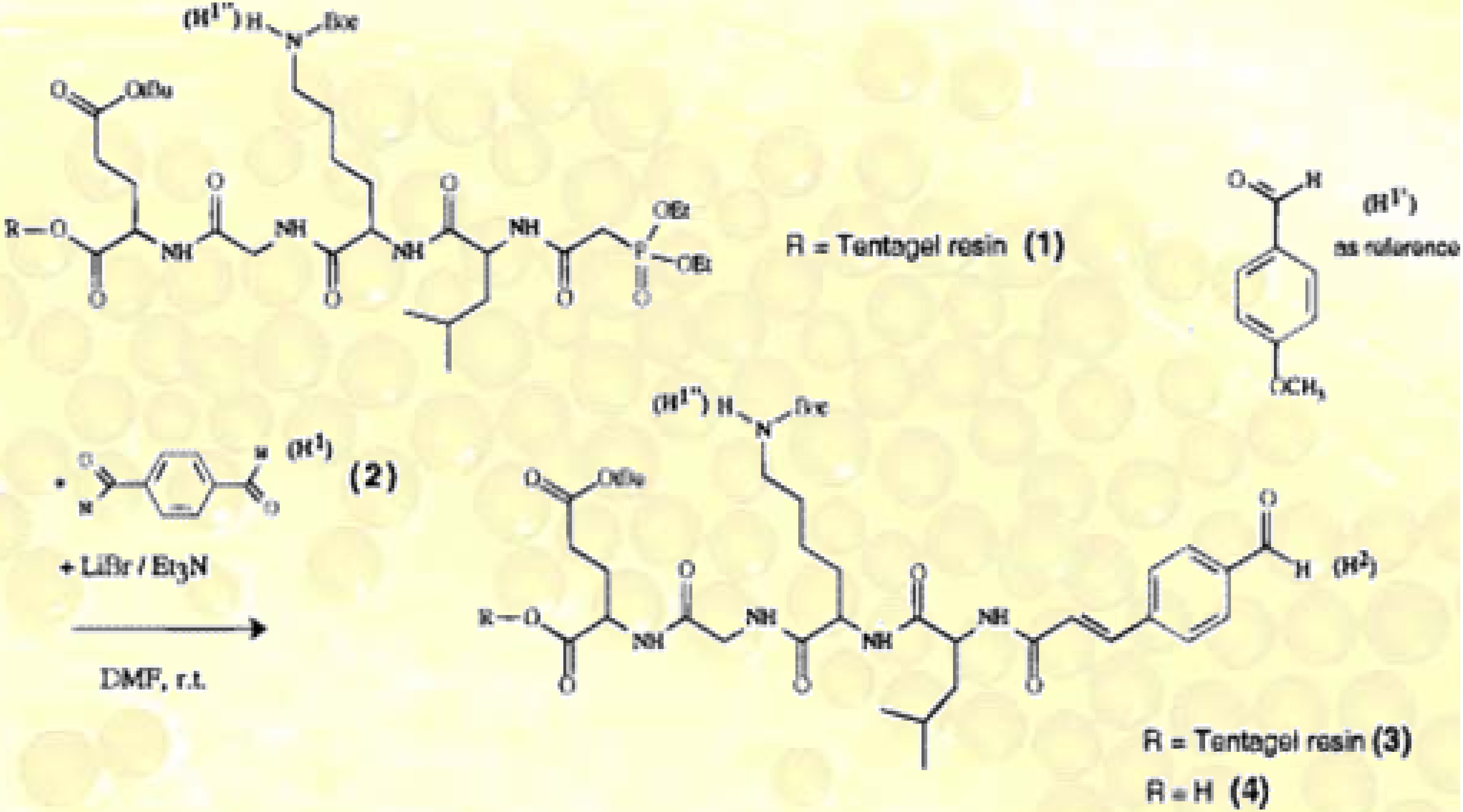
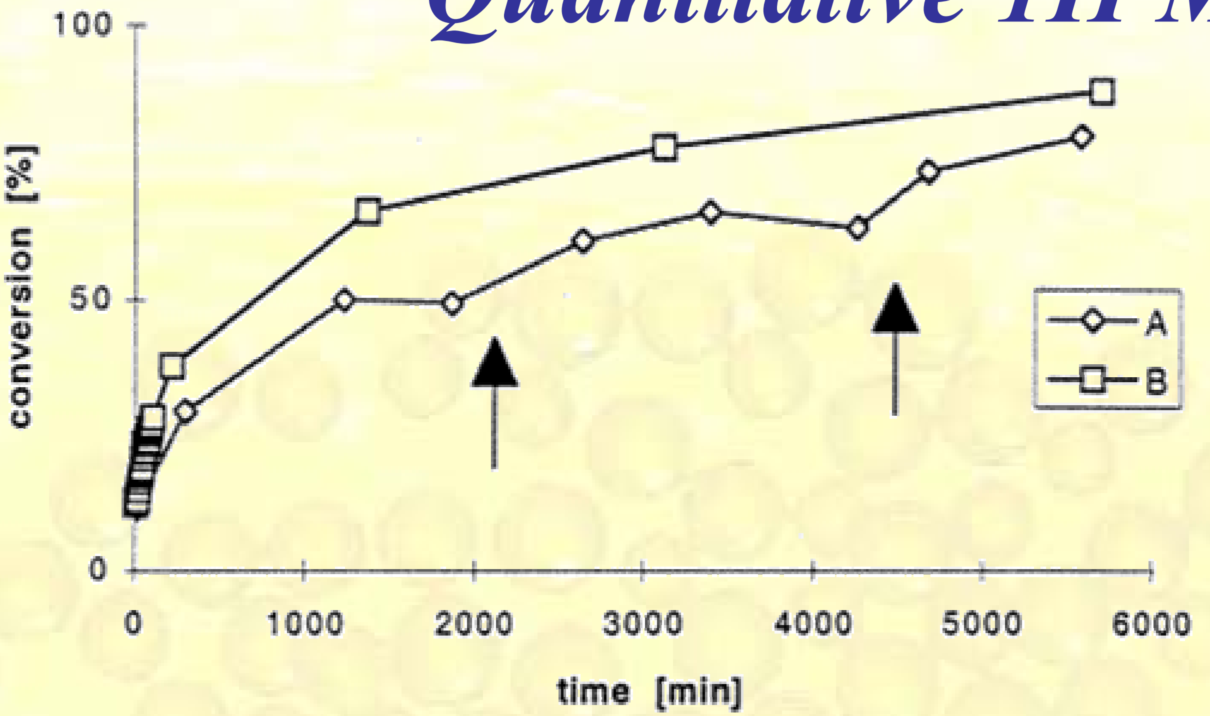
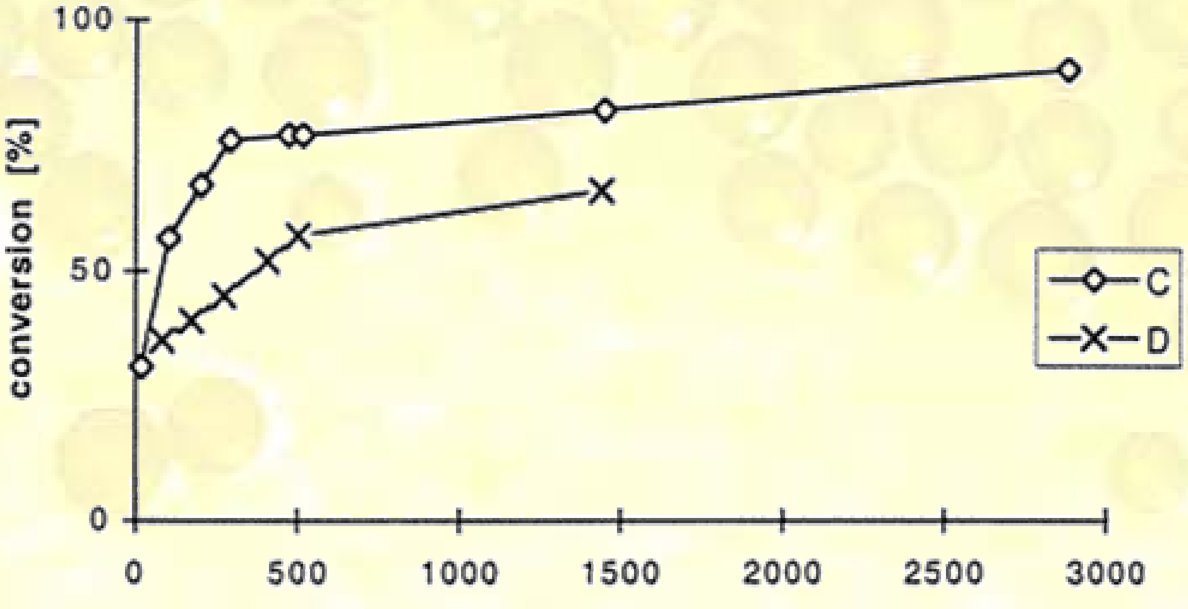
Quantitative 1H MAS NMR



Quantitative 1H MAS NMR





Top: in situ reaction in the rotor) The formation of 3 as a function of time applying different excesses of LiBr/Et3N; conversion form 1 to 3 is followed by comparing proton signal H1 of soluble starting reagent 2 to proton signal H2 of polymer-linked 3;

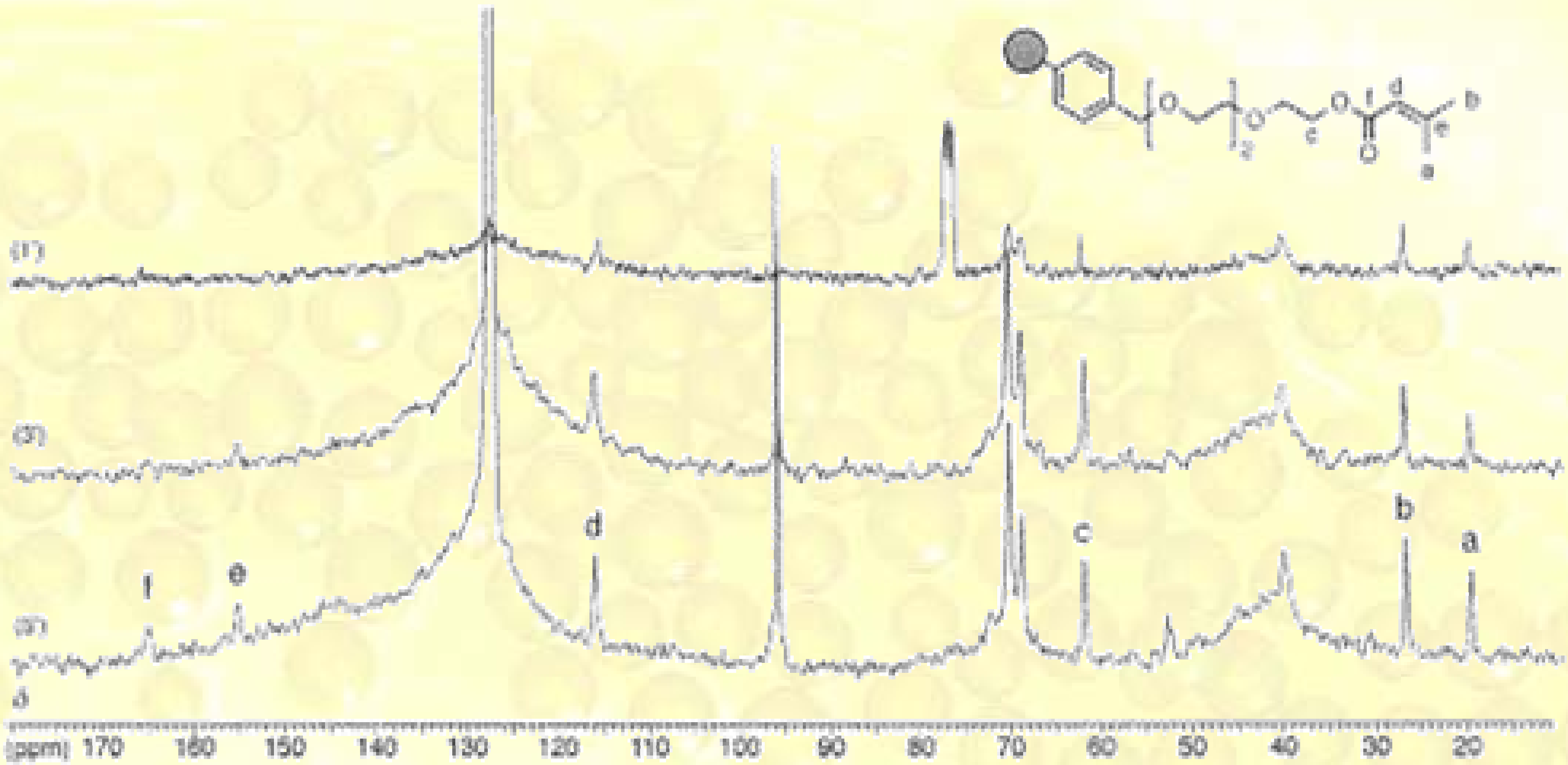
(A) 10 equiv of LiBr/Et3N initially added; arrows indicate the addition of 5 equiv of LiBr/Et3N portions;

(B) 20 equiv of LiBr/Et3N initially added. (Below, experiment 3) Conversion from 1 to 3 in DMF-h7 under standard reaction conditions. The proton signal H1", attributed to the carbamate proton of the lysine side chain by 2D Tocsy spectra, is used as reference to quantify the increasing aldehyde signal H2 of polymer-linked product 3;

(C) represents data from samples taken from the original reaction vessel prior to spectra accumulation;

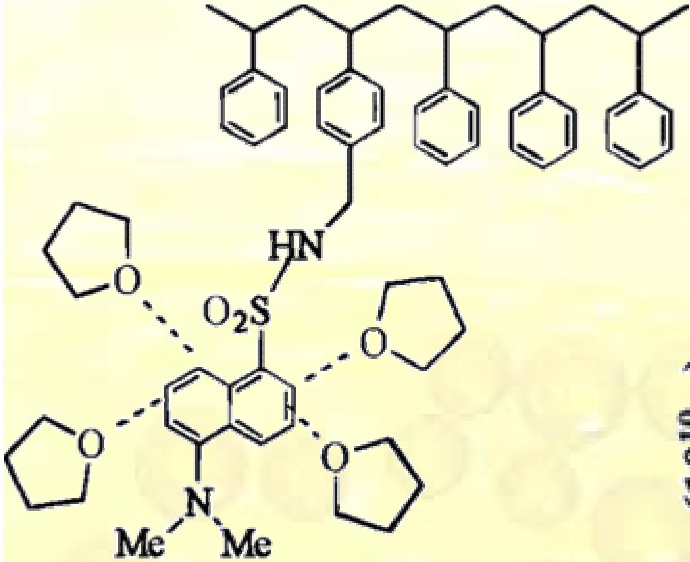
(D) data points are taken from a sample that was kept in the rotor and had no interchange with original reaction conditions.

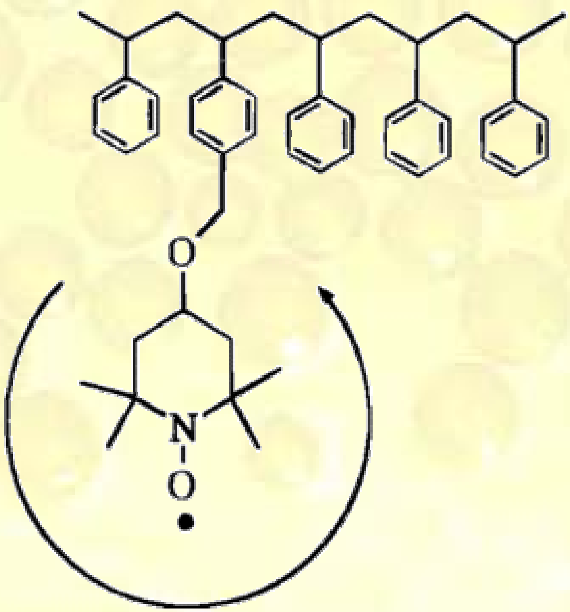
13C Gel NMR

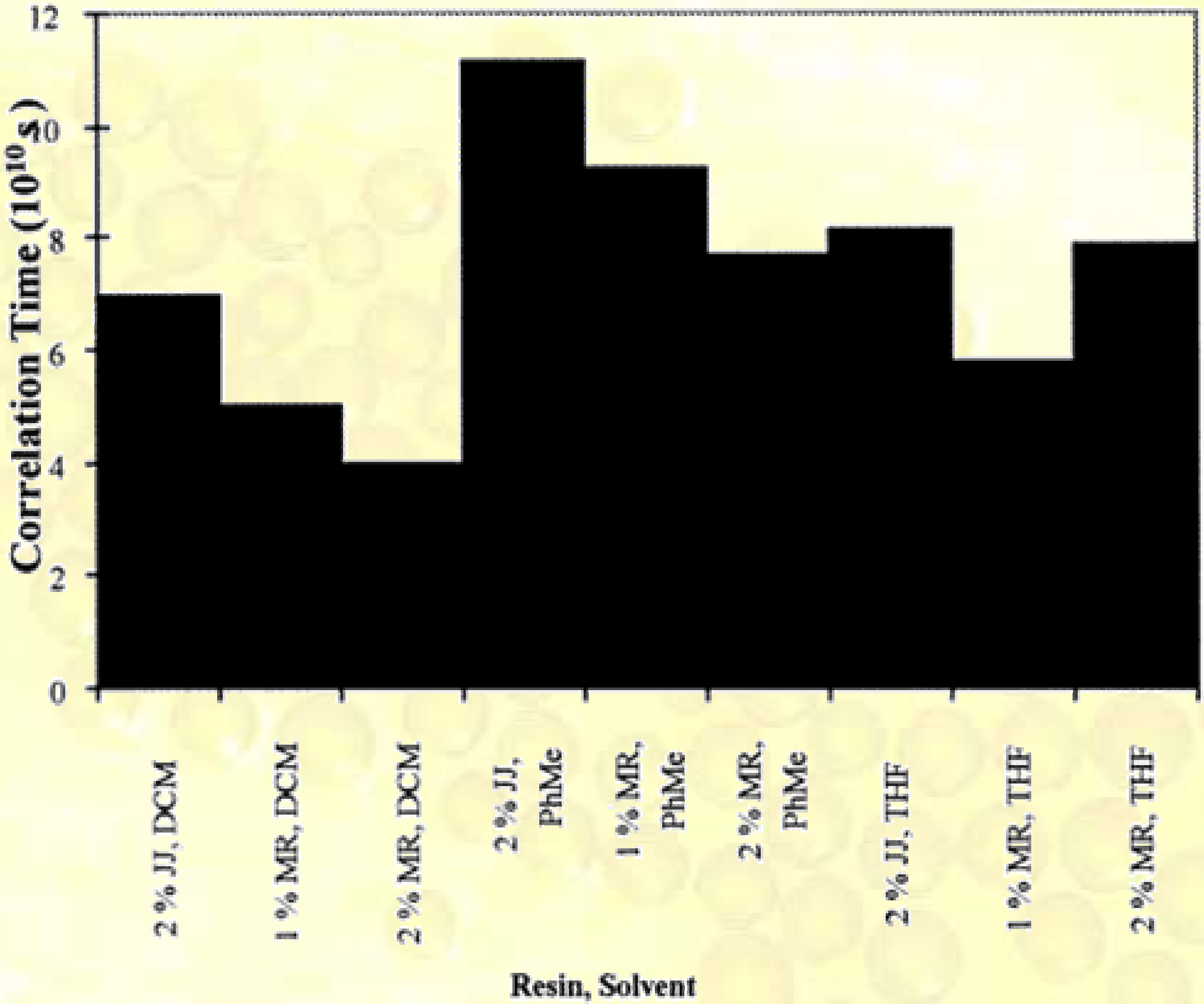


NMR parameters (ns = 2500, pl = 30, aq = 75 ms, dl = 100 ms, rg = rga) and conditions (mixture of CCl4 and 20% of deuterated solvent) that allow one to record the 13C spectra of molecules bound to Merrifield resin via a triethyleneglycol spacer with a classical 300 MHz spectrometer in only 7.5 min acquisition time.

Polymer Environment







Screening Issues

- **Screening Methods**
  - Visual
  - Chemical
  - Biochemical
  - Biological
  - Autoselection

- **Issues**
  - Accessibility (cf. assay type)
  - False positive/negative
  - Chemical compatibility

Lecture 6

- **Latest developments in Supports for Solid-Phase Synthesis**

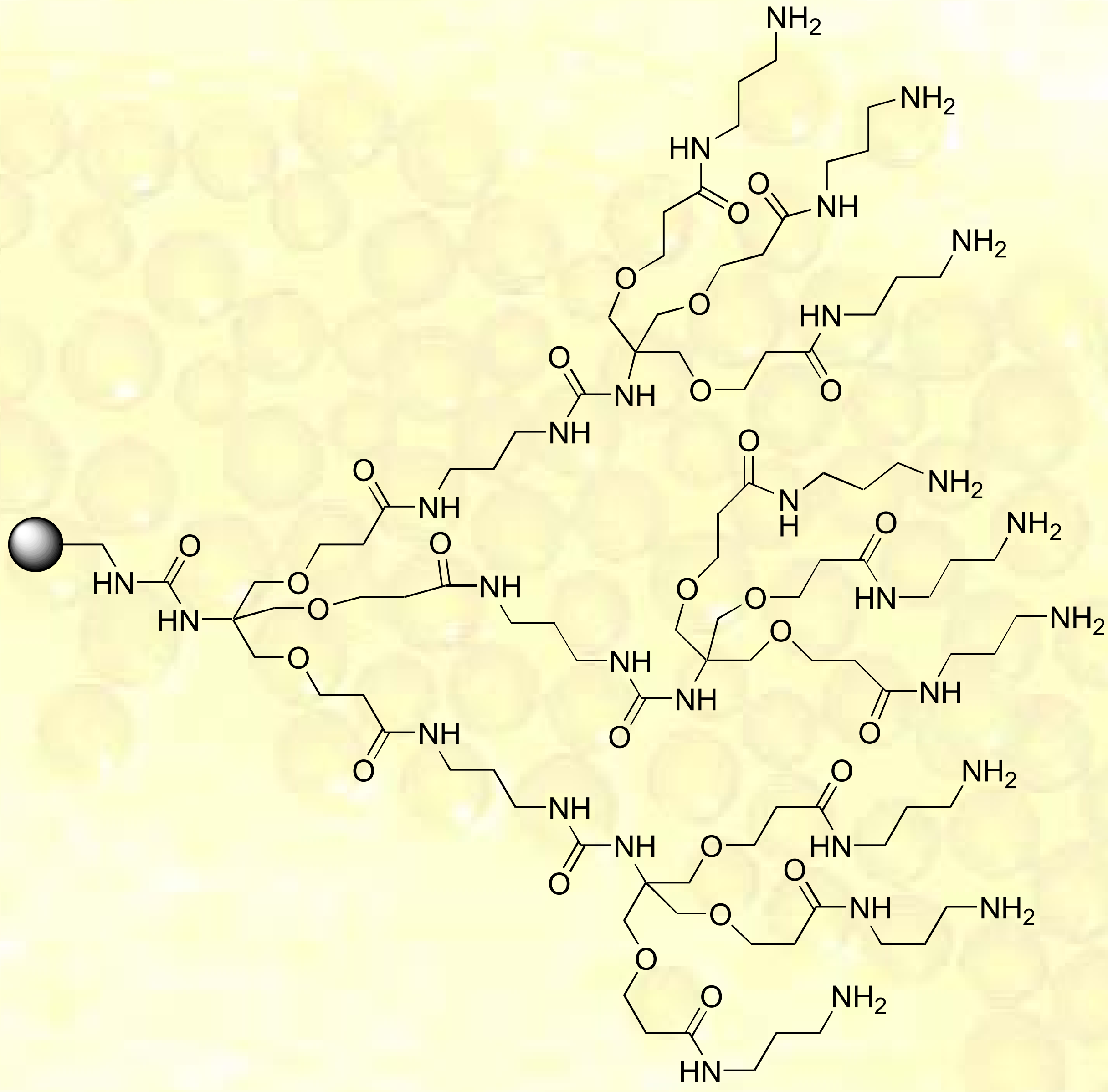
Polymer supports properties: what is still an issue?

A universal or "perfect" support should…

- **be as chemically inert and stable as polyethylene or PTFE (but functional)**
- **be mechanically stable (PS)**
- **present adjustable loading levels (PS)**
- **be as solvent compatible as PEG for polar solvents and PS for non-polar solvents**

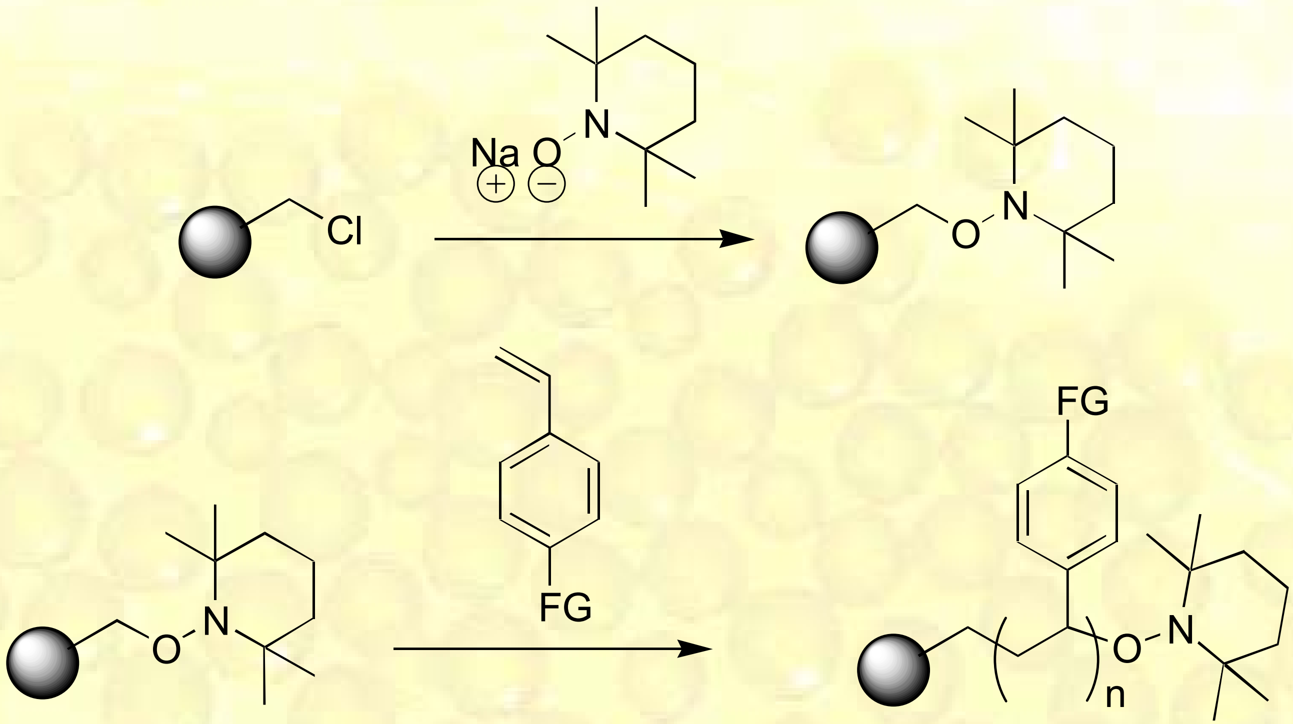
Latest developments

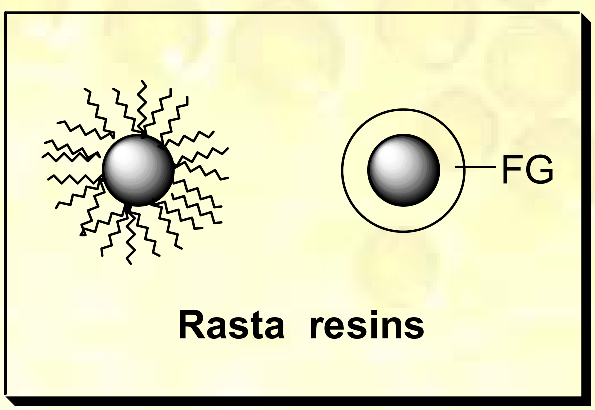
Increasing loading levels: Supported dendrons



Latest developments

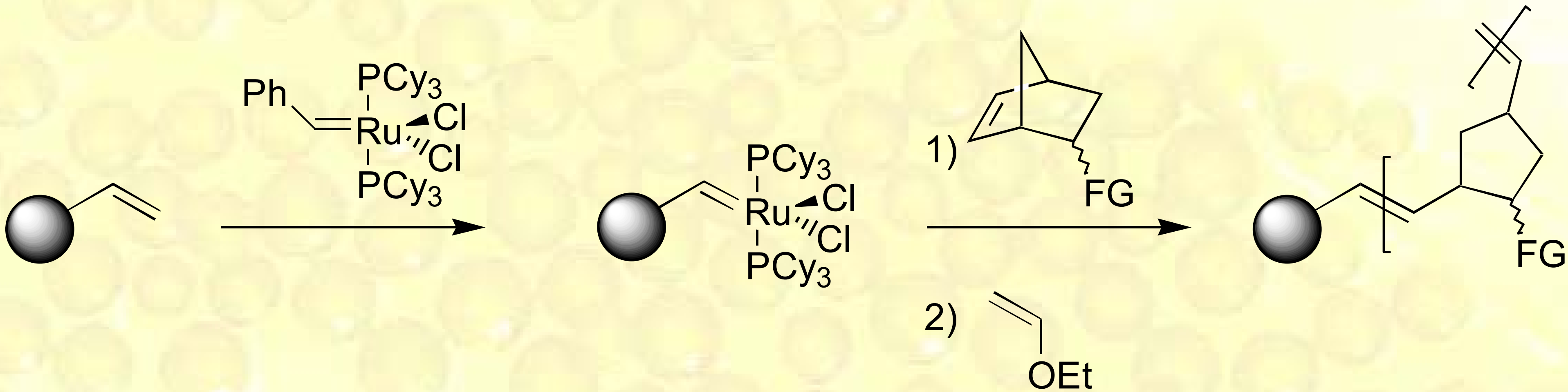
Increasing loading levels: Rasta resins





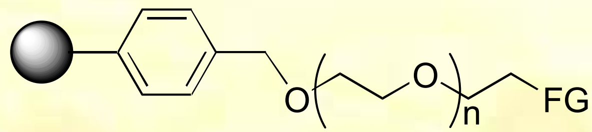
Latest developments

Increasing loading levels: ROMP-Spheres

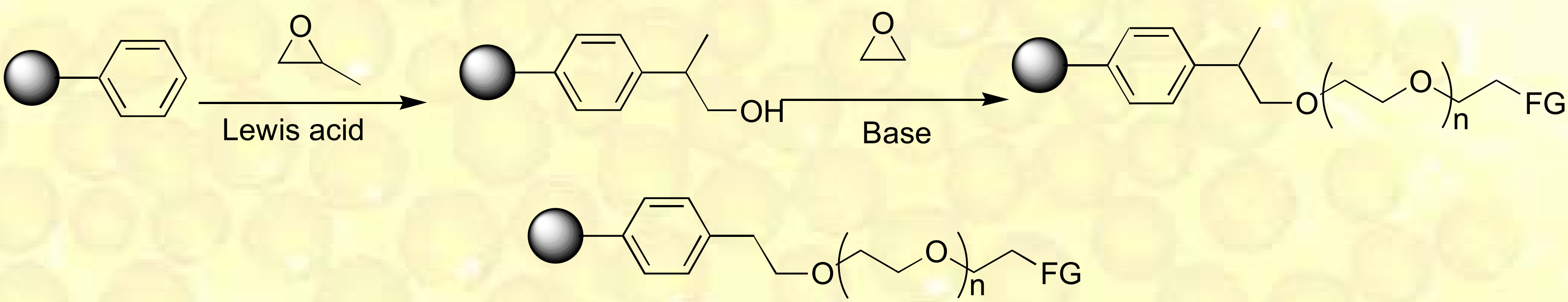


Latest developments

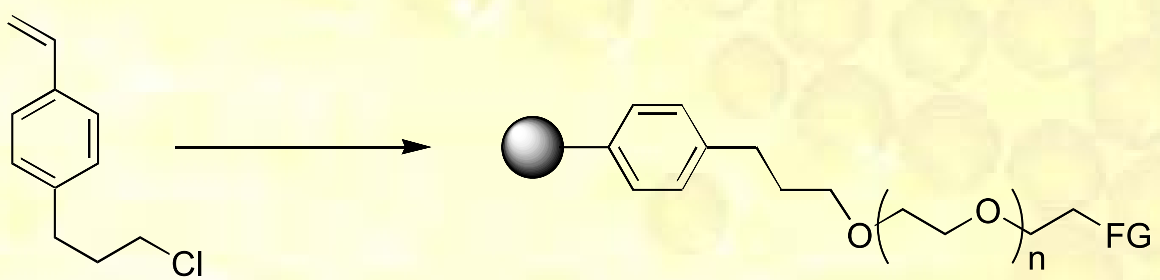
Improving chemical stability



Original PS-PEG supports:
acid labile



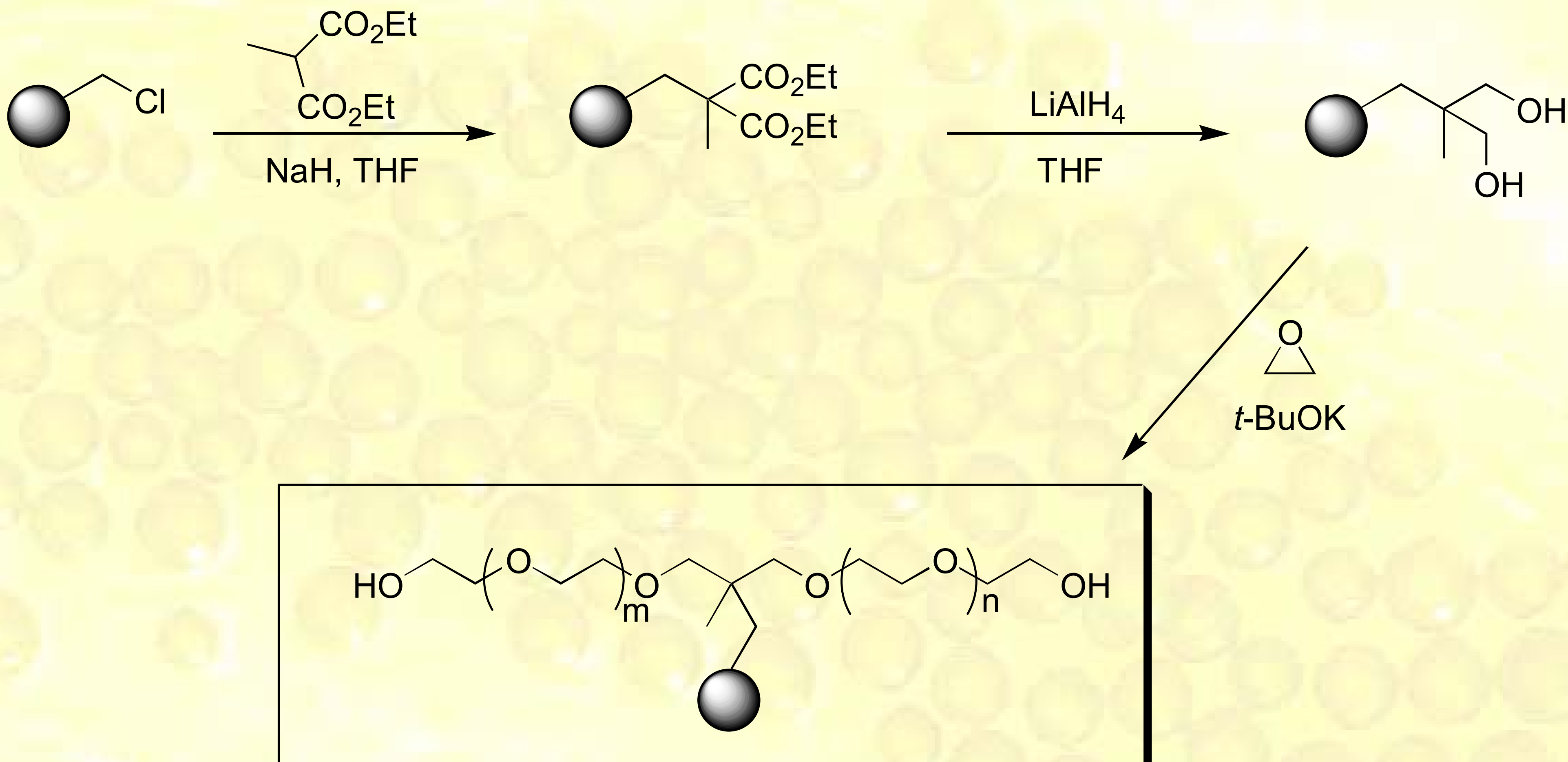
2nd generation PS-PEG supports:
base labile



More stable towards acids and bases

Latest developments

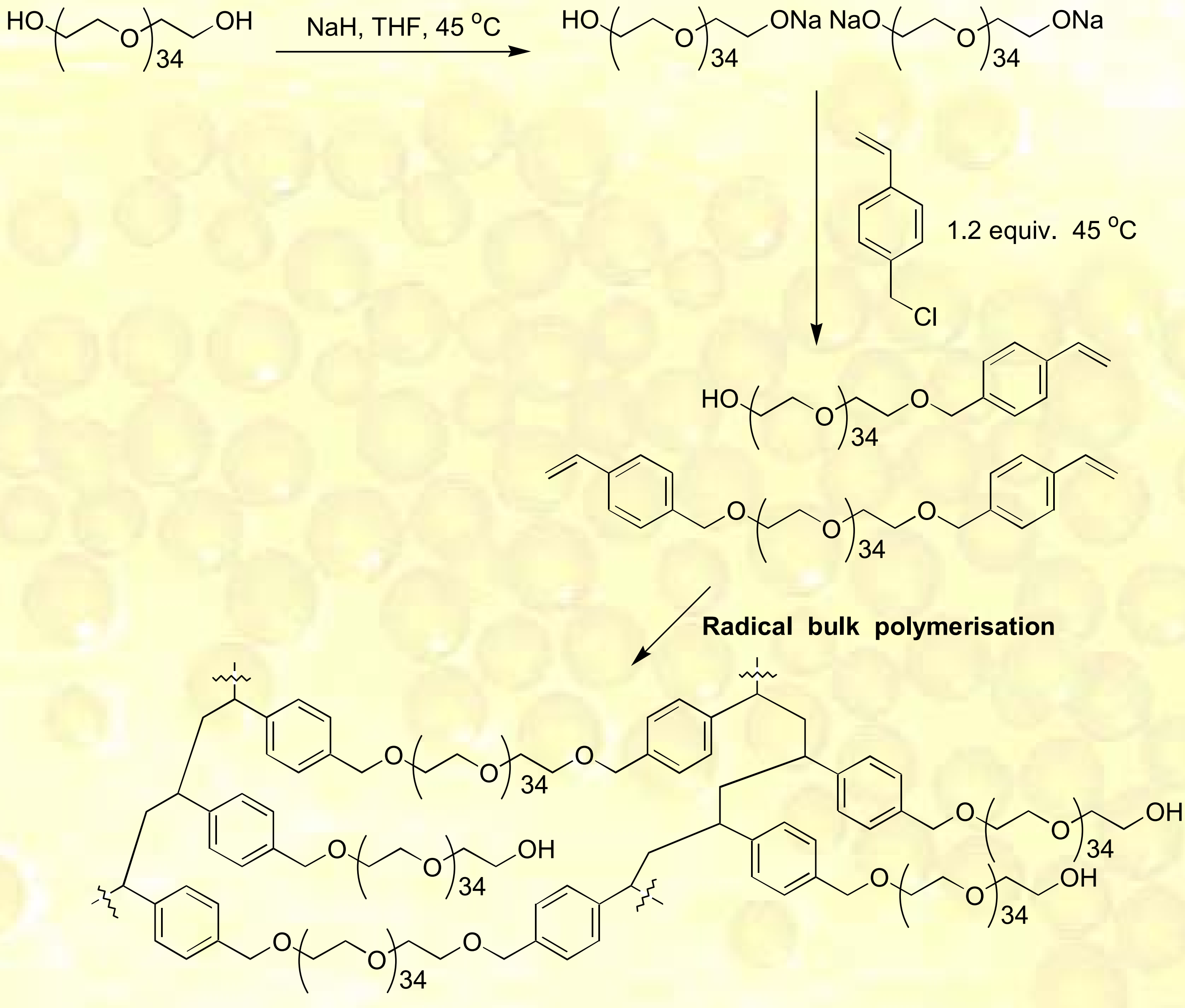
Improving chemical stability



Argogel™

Latest developments

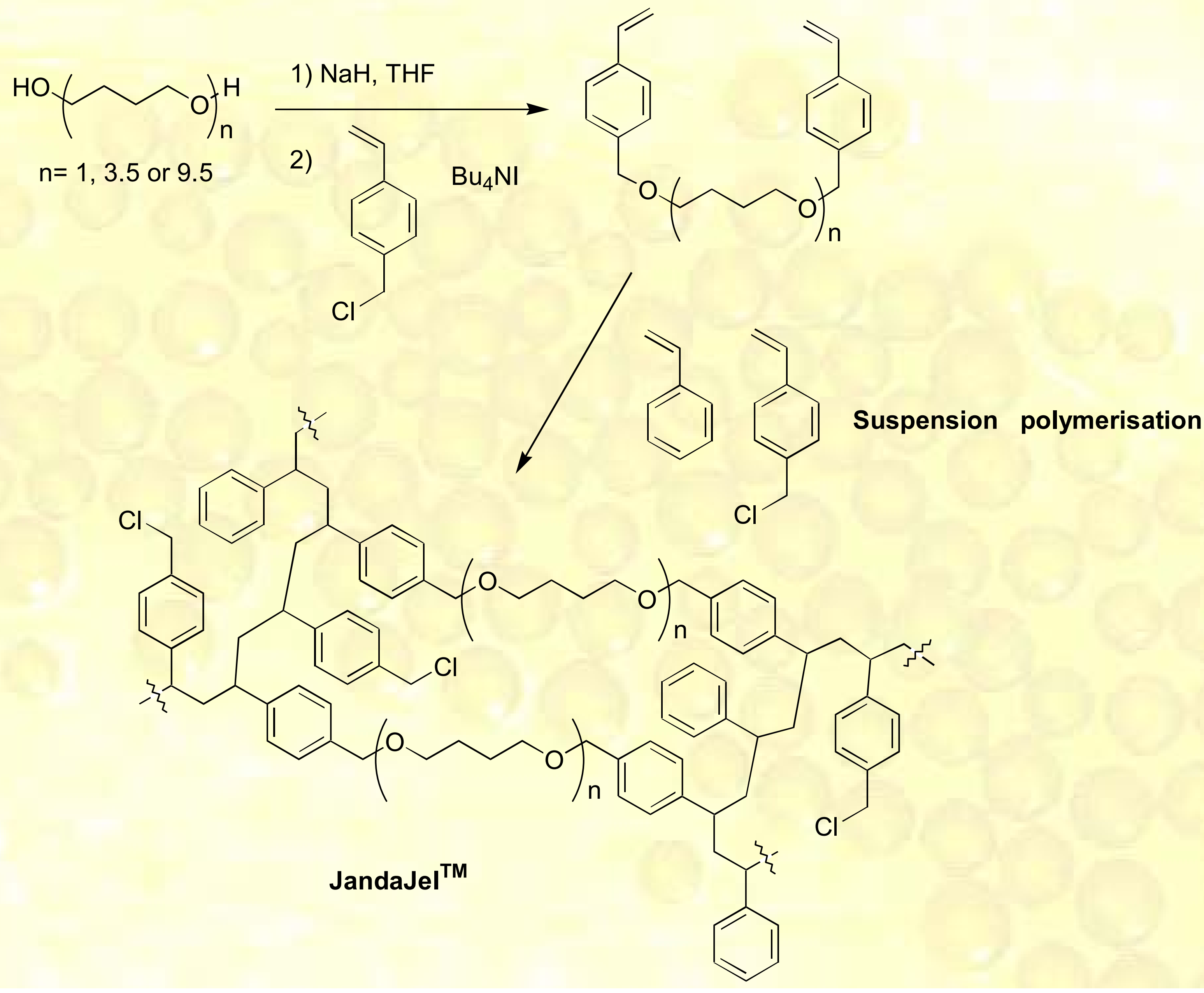
Improving solvent compatibility



Polyoxyethylene-polystyrene (POEPS)

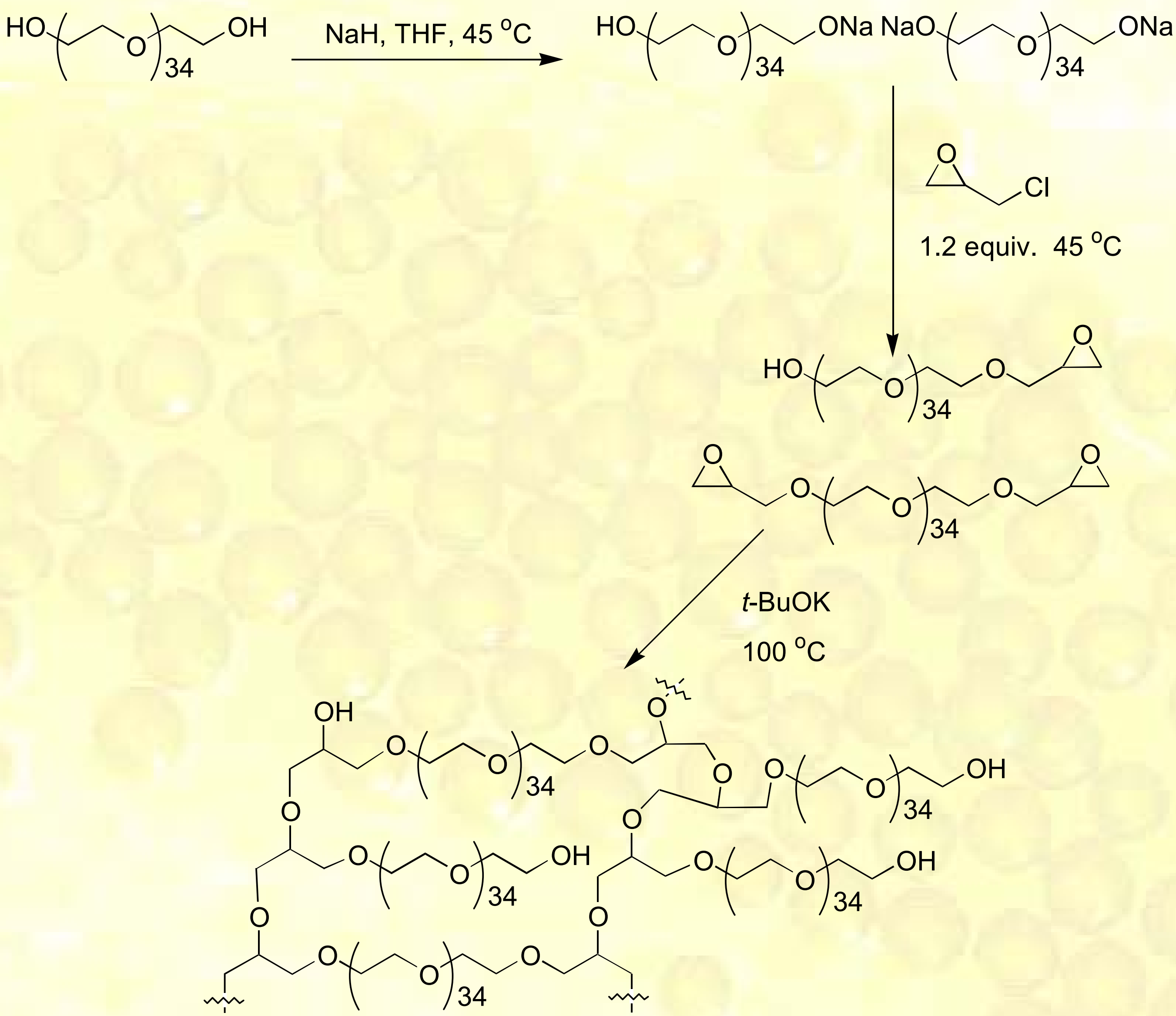
Latest developments

Improving solvent compatibility



Latest developments

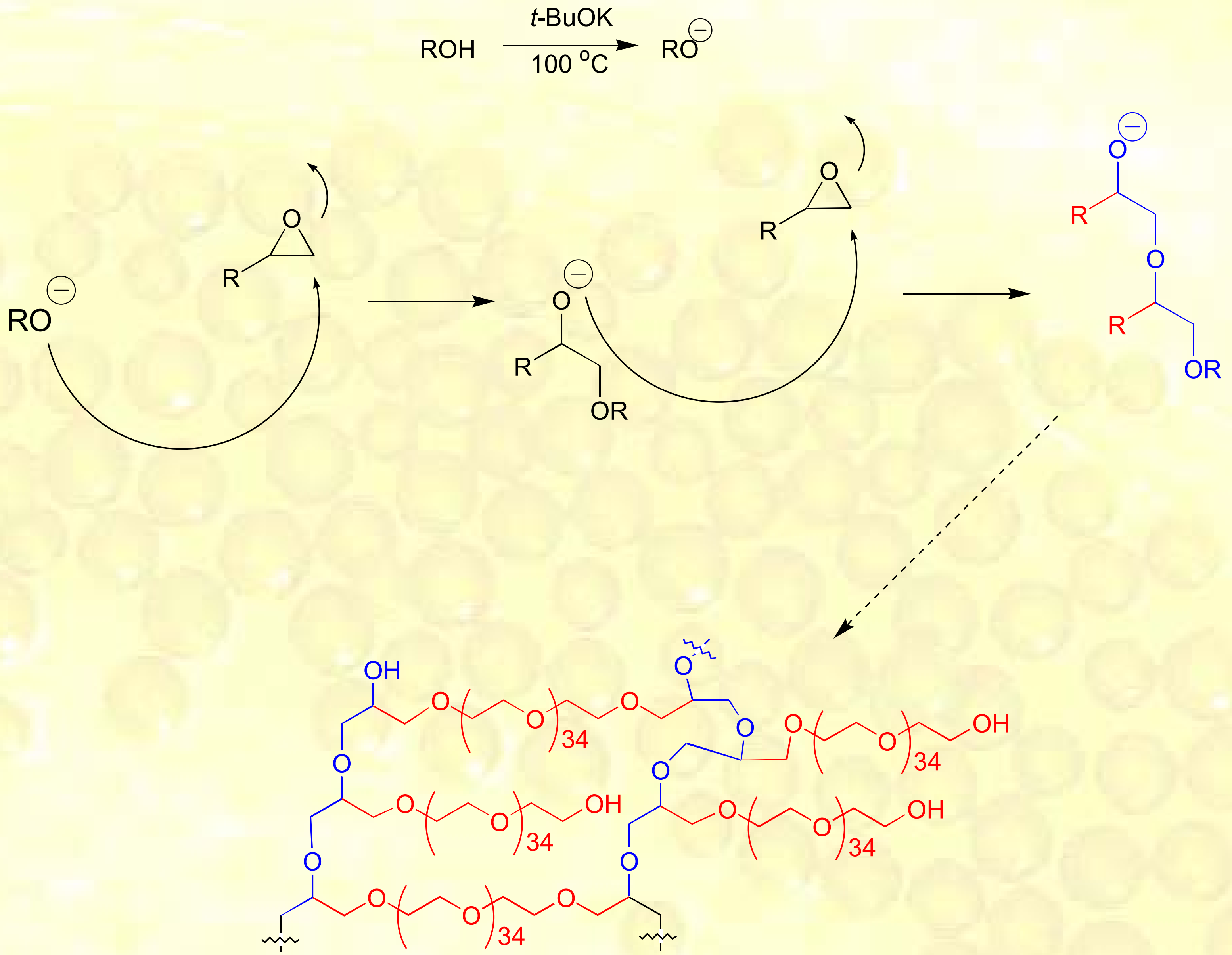
Improving solvent compatibility



Polyoxyethylene-polyoxypropylene (POEPOP)

Latest developments

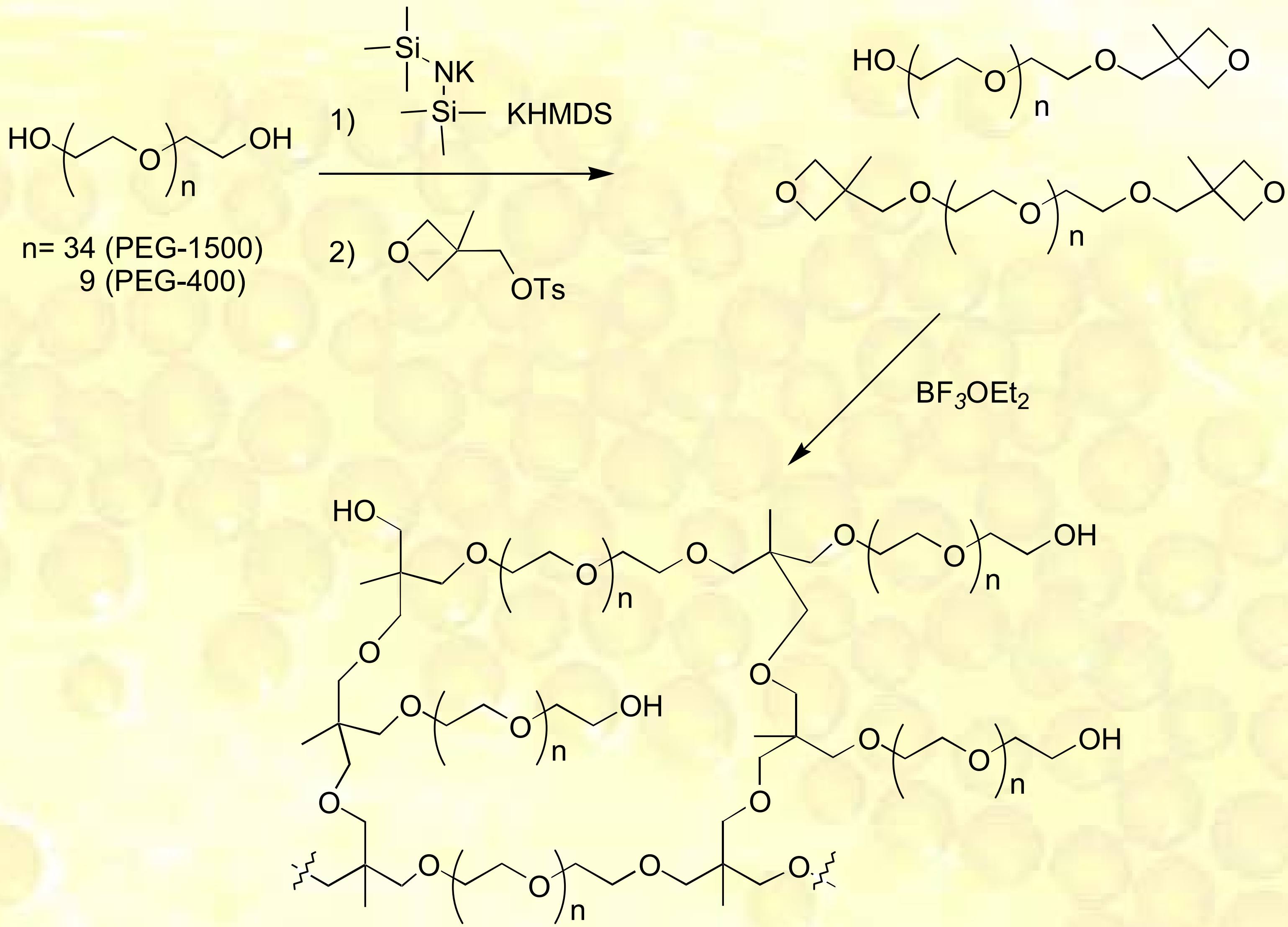
Improving solvent compatibility



Polyoxyethylene-polyoxypropylene (POEPOP)

Latest developments

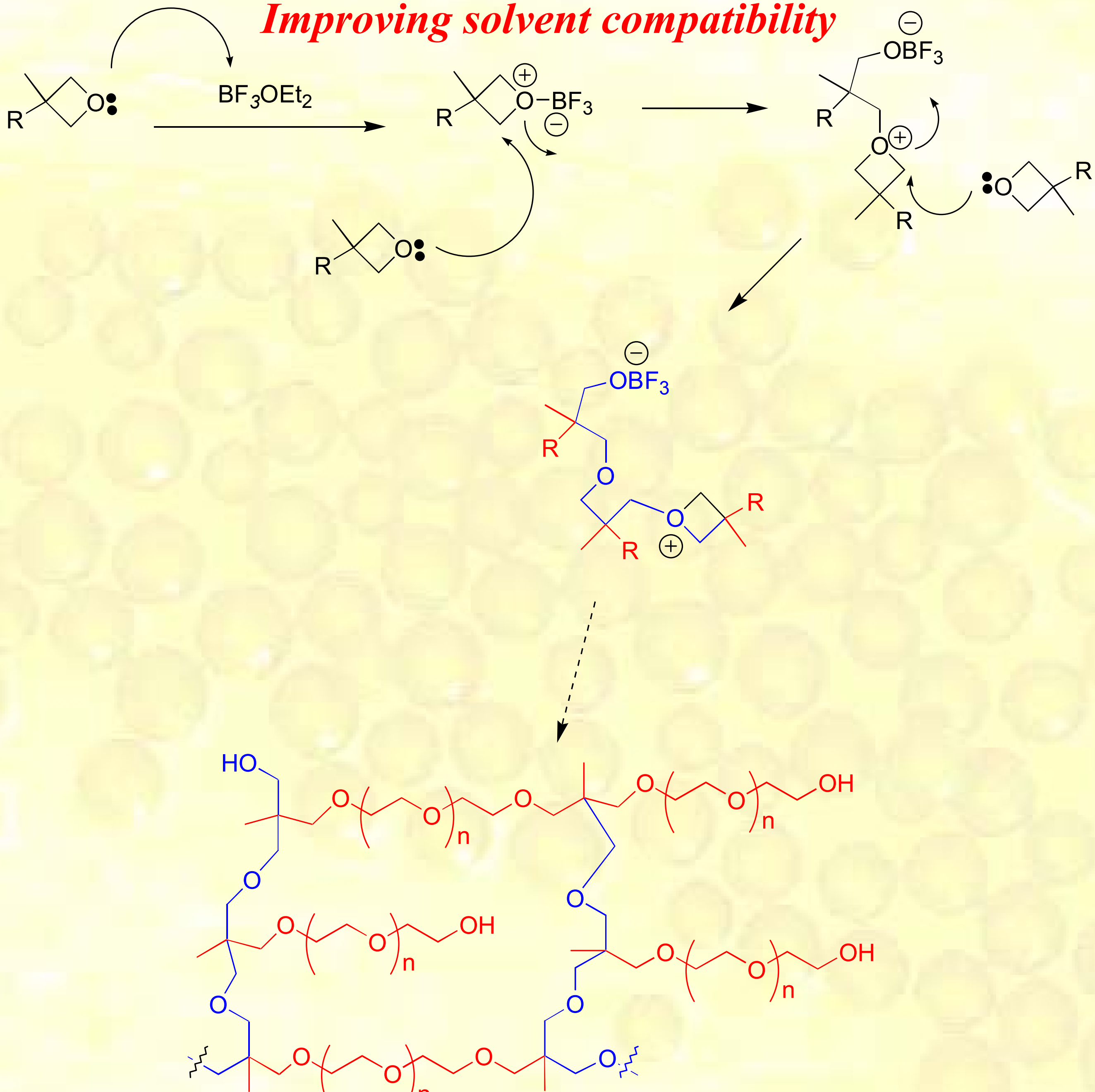
Improving solvent compatibility



Superpermeable organic combinatorial chemistry resin (SPOCC)

Latest developments

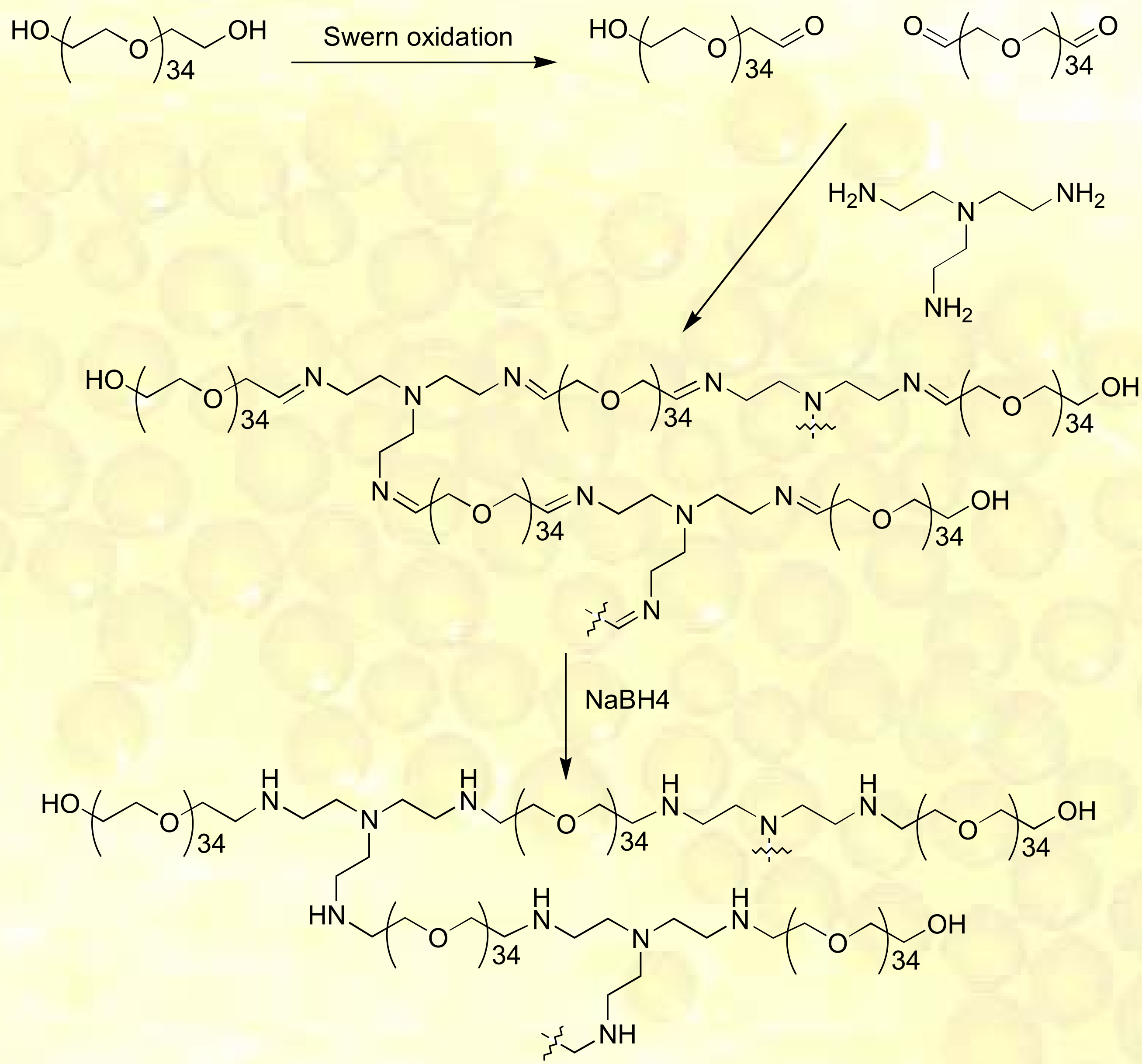
Improving solvent compatibility



Superpermeable organic combinatorial chemistry resin (SPOCC)

Latest developments

Improving solvent compatibility



HYDRoxy and Amine functionalised resin (HYDRA)