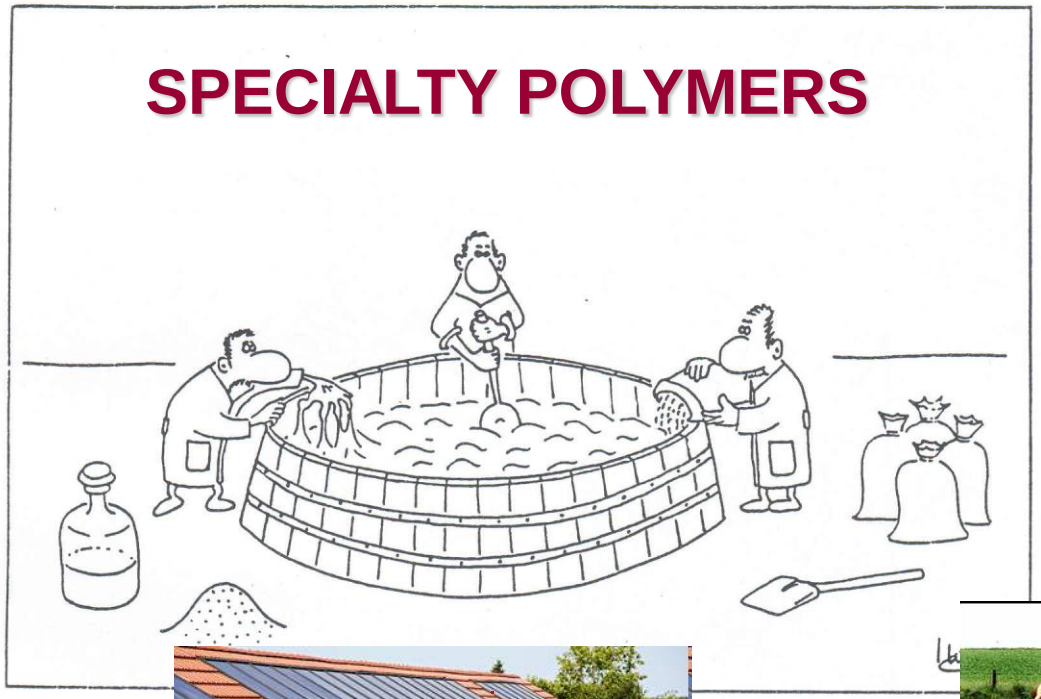
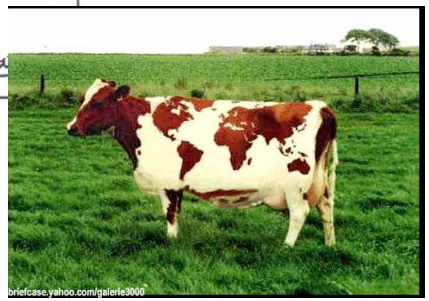
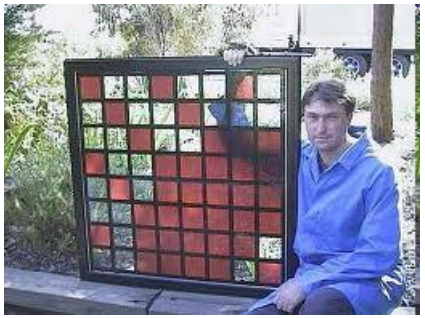
SPECIALTY POLYMERS





Polymer sorbents



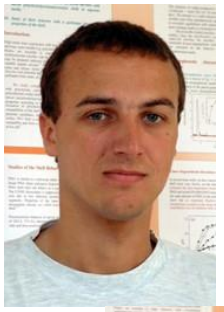
Polymers from renewable sources

Polymers for optoelectronics

SPECIÁLNÍ POLYMERY

Prof. Jiří Vohlídal

1. Nanoporézní polyacetyleny pro adsorpce plynů
   Doc. Jan Sedláček

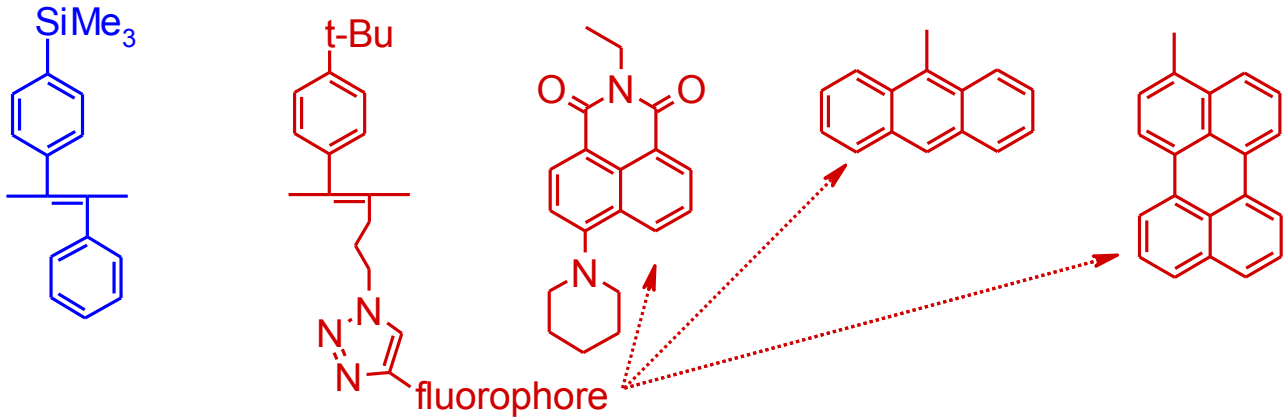


2. Konstitučně-dynamické konjugované polymery
   Dr. Jan Svoboda

3. Polymery z monomerů dostupných z přírodních zdrojů
   Dr. Jiří Zedník

4. Vývoj polymerizačních katalyzátorů

Poly(disubstituované acetyleny) a polyacetylenické sítě

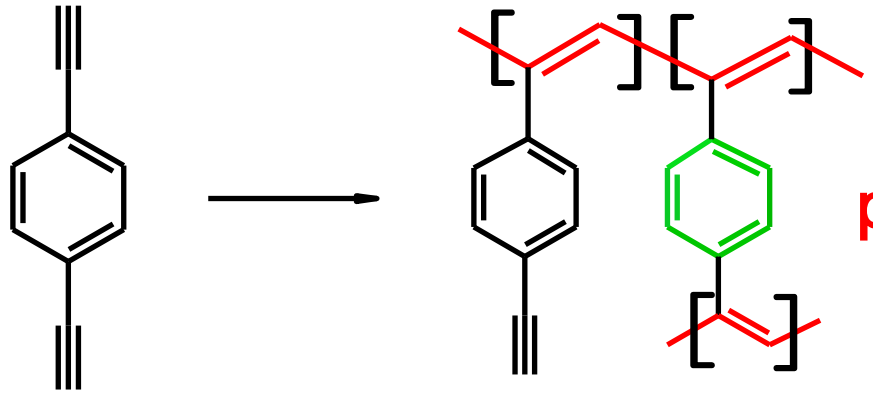


velký specifický povrch - mikroporezita

sorbenty malých molekul (zájem o vodík)

silná luminiscene

Does the polymerization of a diethynyl monomer directly provide a useful network polymer?



1,4-DEB P(1,4-DEB)

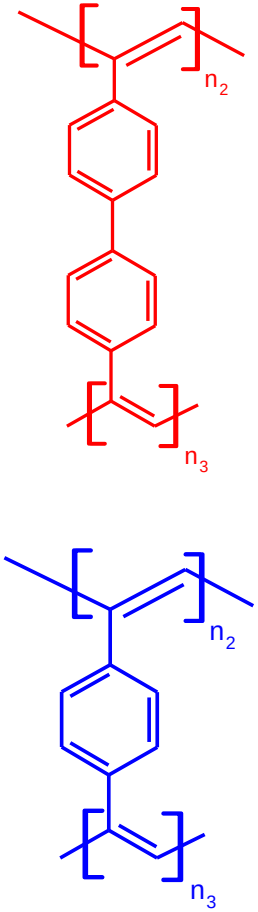
polyacetylene chains cross-linked via arylene linkers

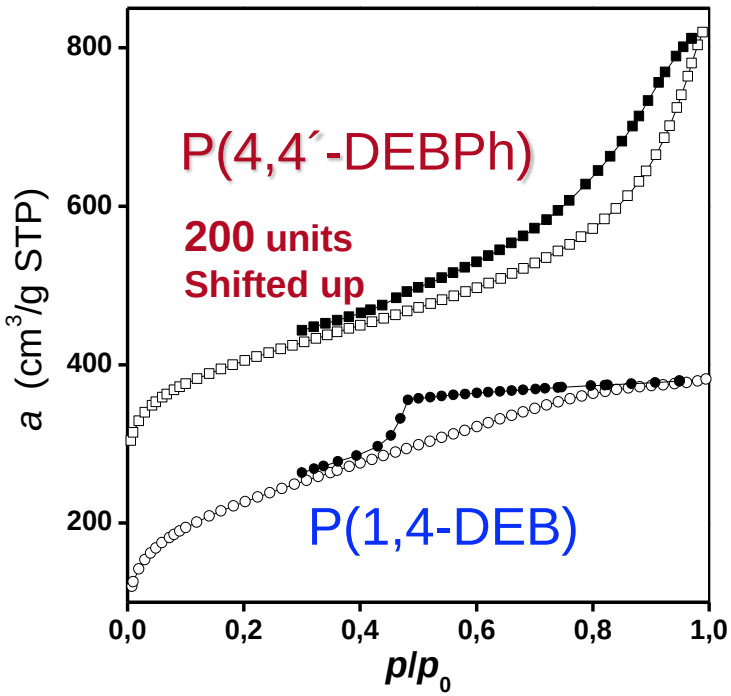
Desirable product:
micro/mesoporous network with a high specific surface

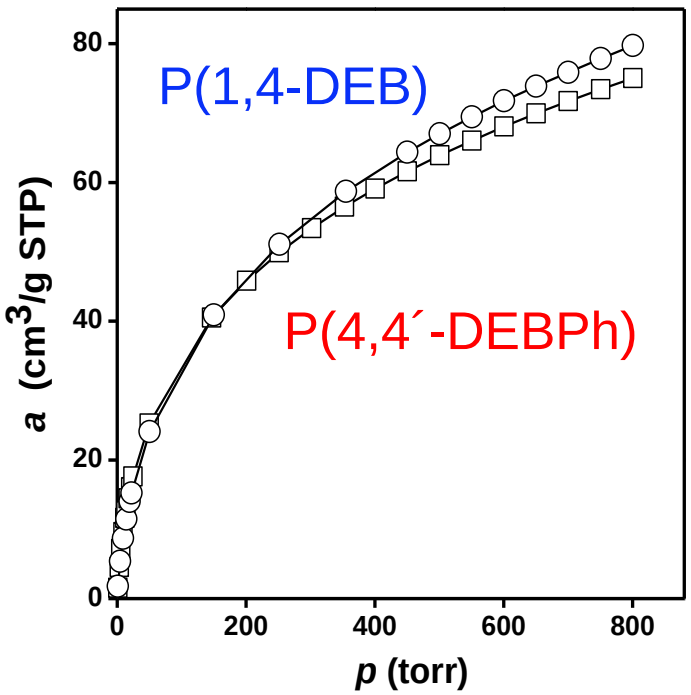
Surprisingly, this topic has not been studied
The only described chain-growth polymerization of DEB was aimed a branched polyacetylene with ethynylphenyl side groups

X. Zhan , M. Yang , Z. Lei , *J. Mol. Catal. A: Chem.* 2002 , *184*, 139 .

Adsorption characteristics



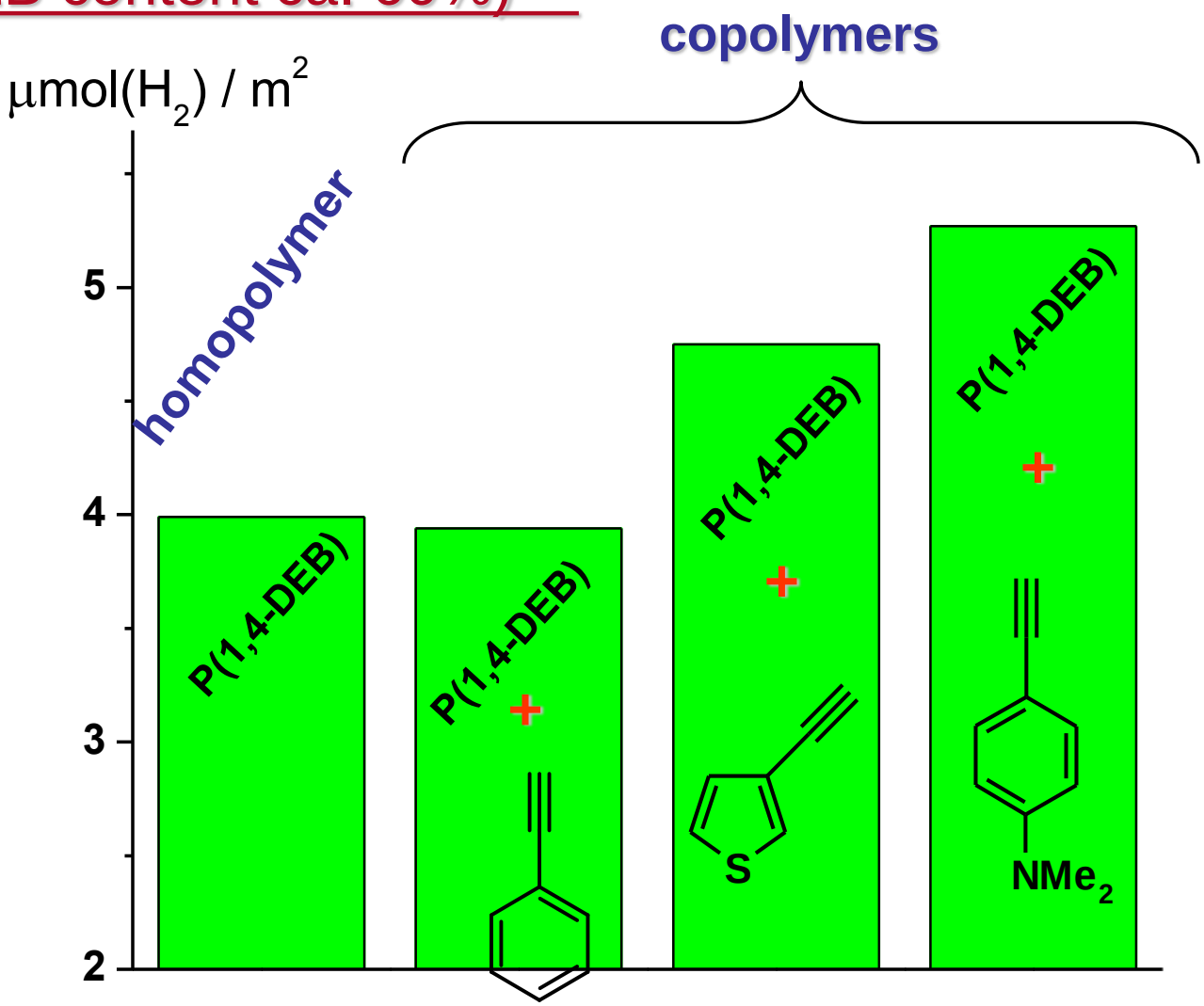




N_2 adsorption
S_{BET} up to 882 m^2/g

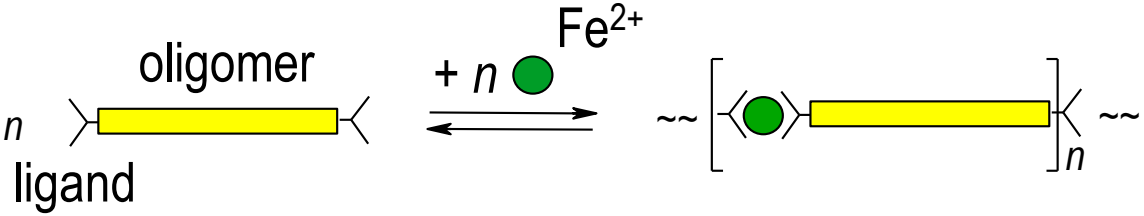
H_2 adsorption up to
1 % wt. (77K, 1 bar)

H_2 adsorption on 1,4-DEB based copolymers (1,4-DEB content ca. 60%)

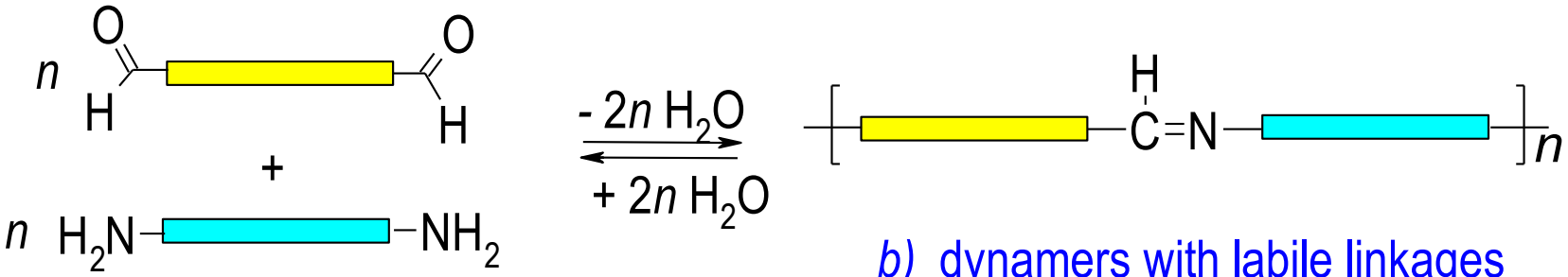


Heteroatoms (S,N) partially increased amount of H_2 adsorbed per m^2

Constitutional-dynamic polymers

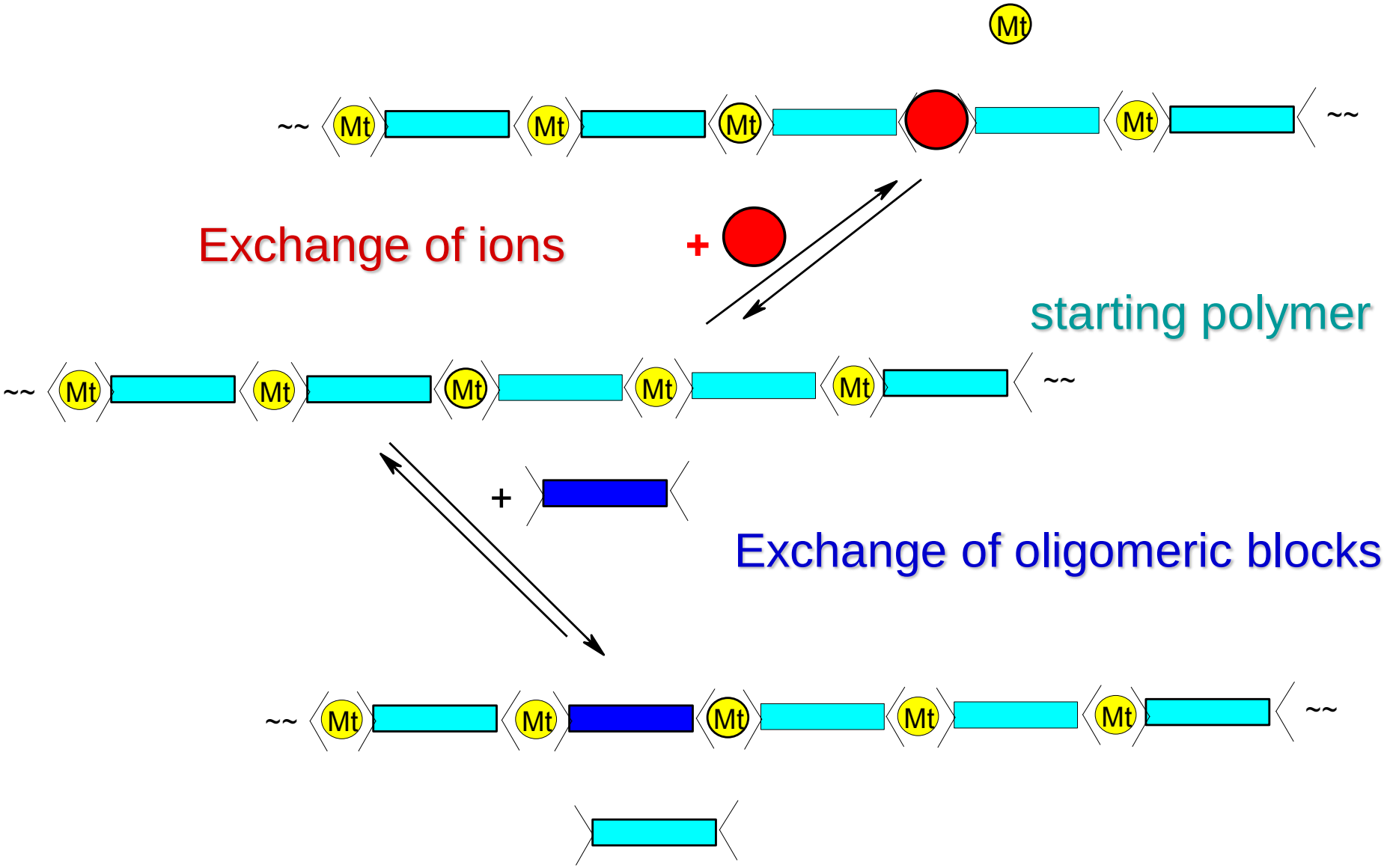


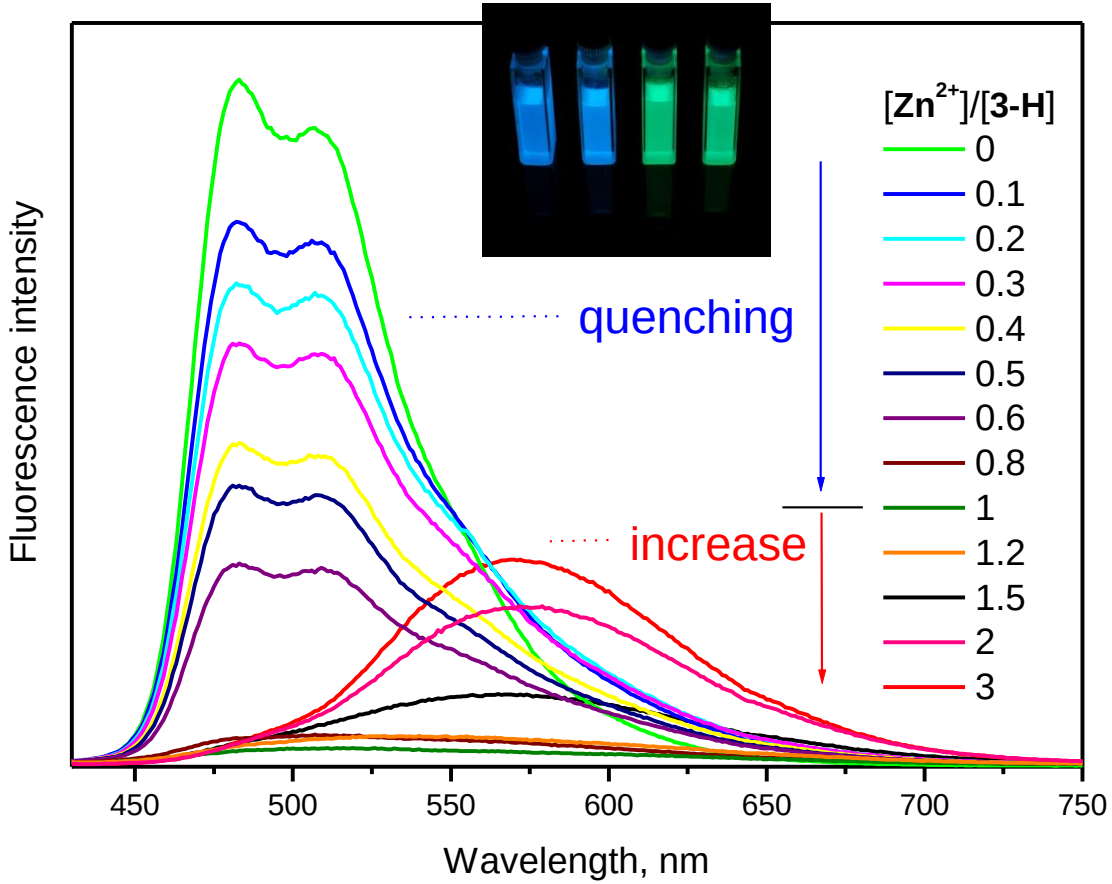
a) linear metallo-supramolecular dynamers

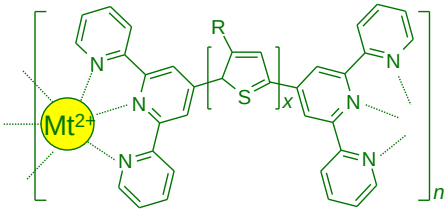


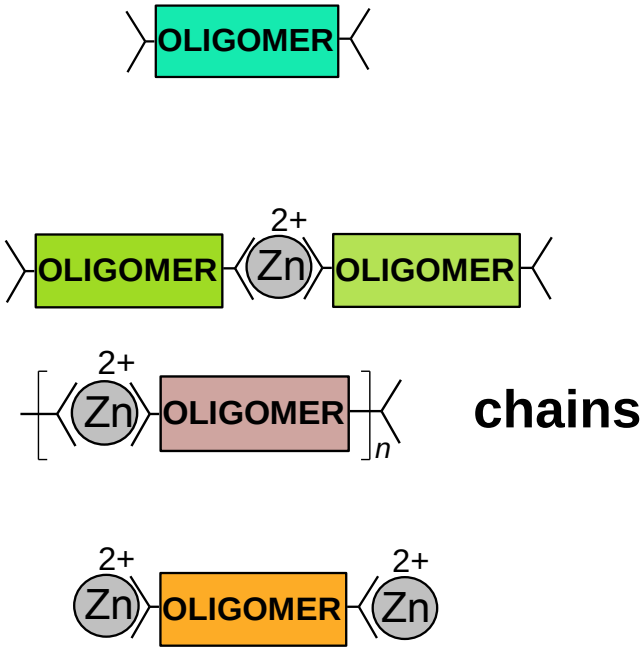
b) dynamers with labile linkages

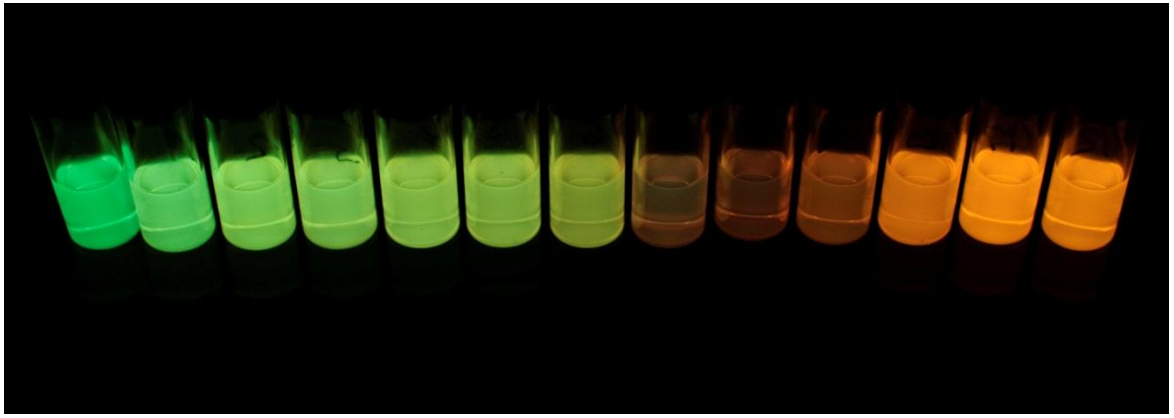
Constitutional dynamics of coordinational dynamers

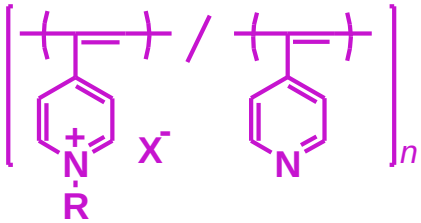


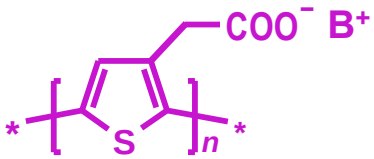

Fluorescence intensity
Wavelength, nm
450
500
550
600
650
700
750
quenching
increase
[Zn2+]/[3-H]
0
0.1
0.2
0.3
0.4
0.5
0.6
0.8
1
1.2
1.5
2
3

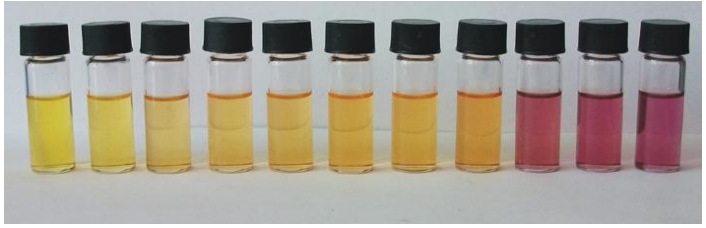

Mt2+
R
S
x
n

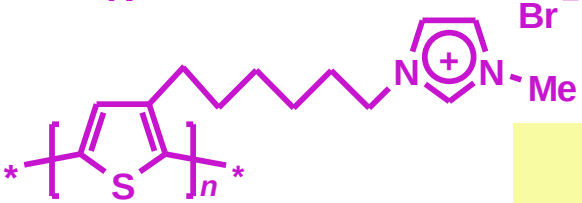

OLIGOMER
OLIGOMER
2+
Zn
OLIGOMER
2+
Zn
OLIGOMER
n
2+
Zn
OLIGOMER
2+
Zn
chains



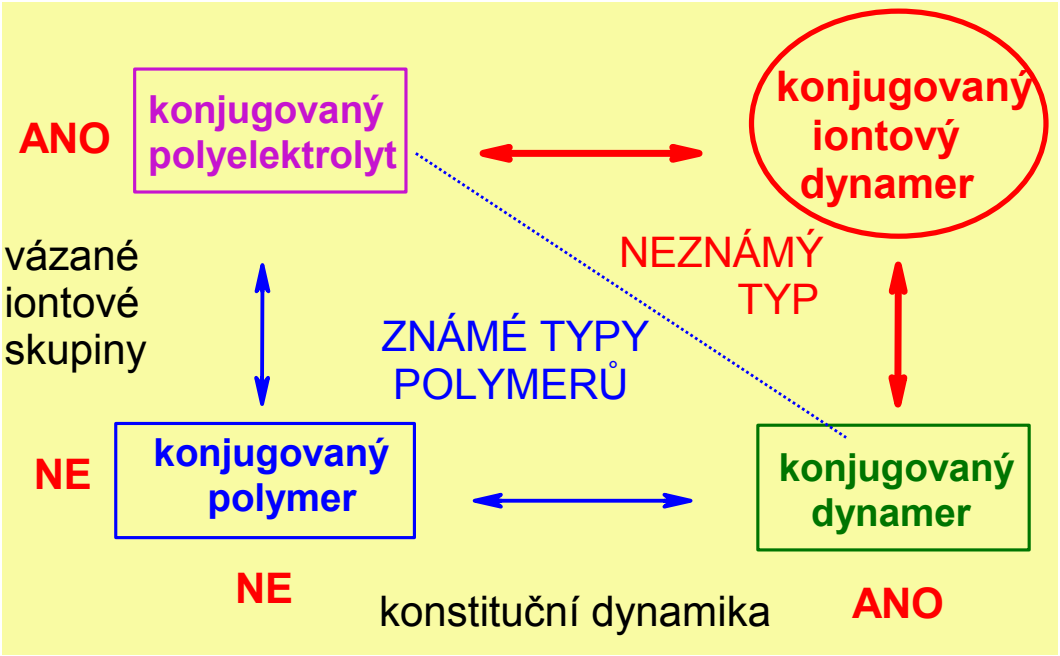


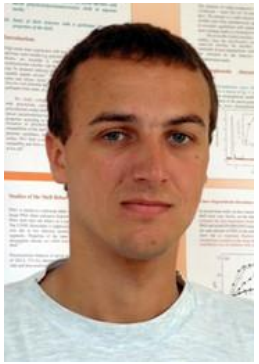


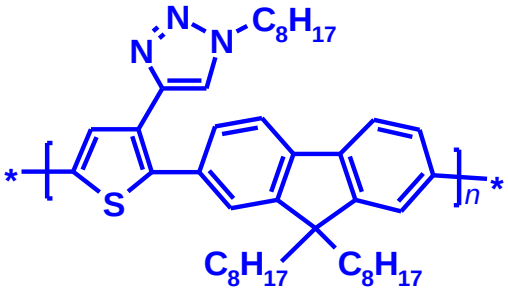


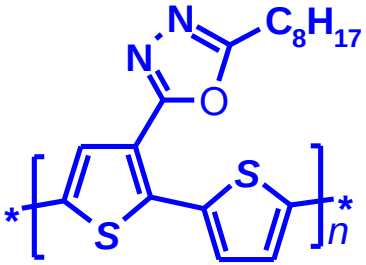


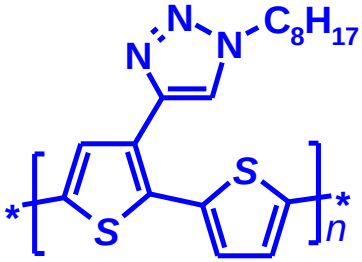
Pracuje se na tom

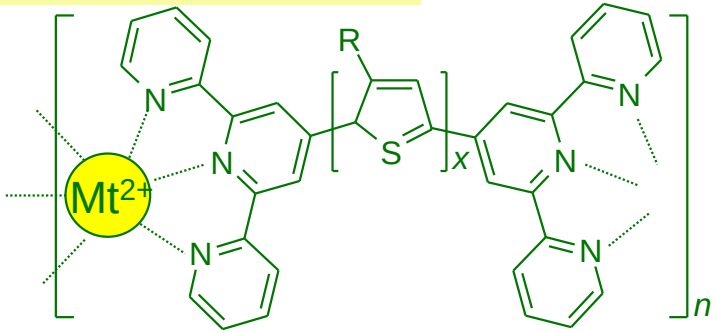




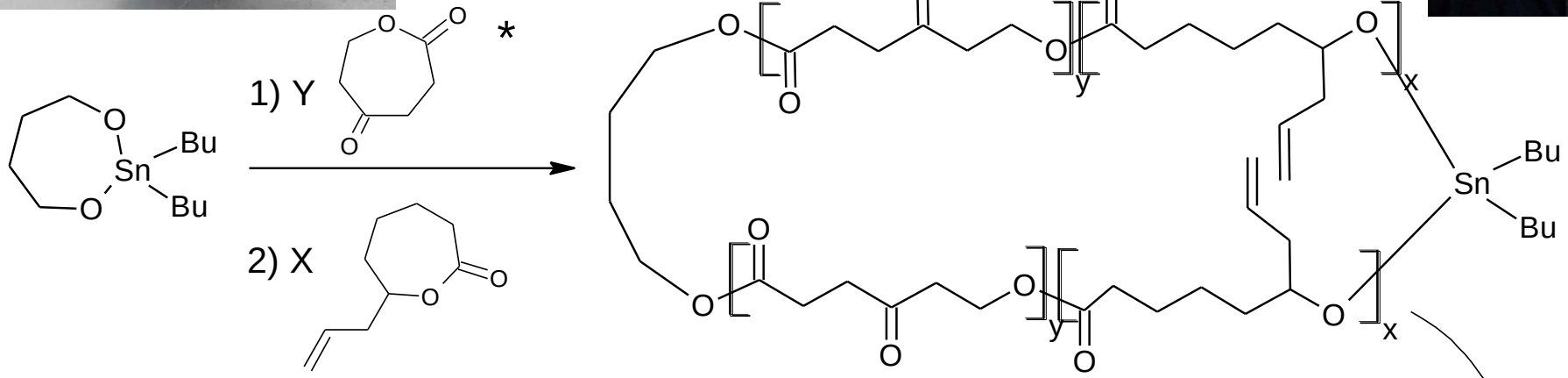






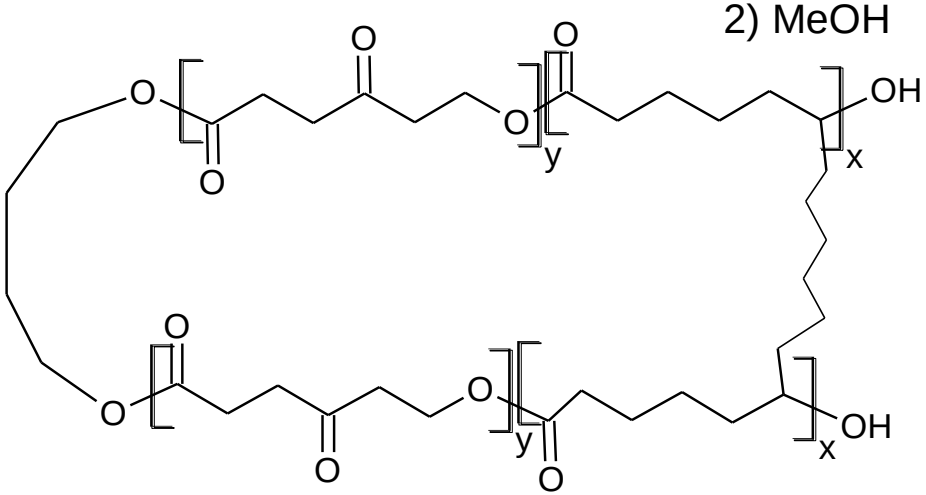


„Zelené polymery“

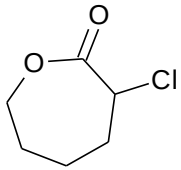


1) UV ozaøování,

2) MeOH

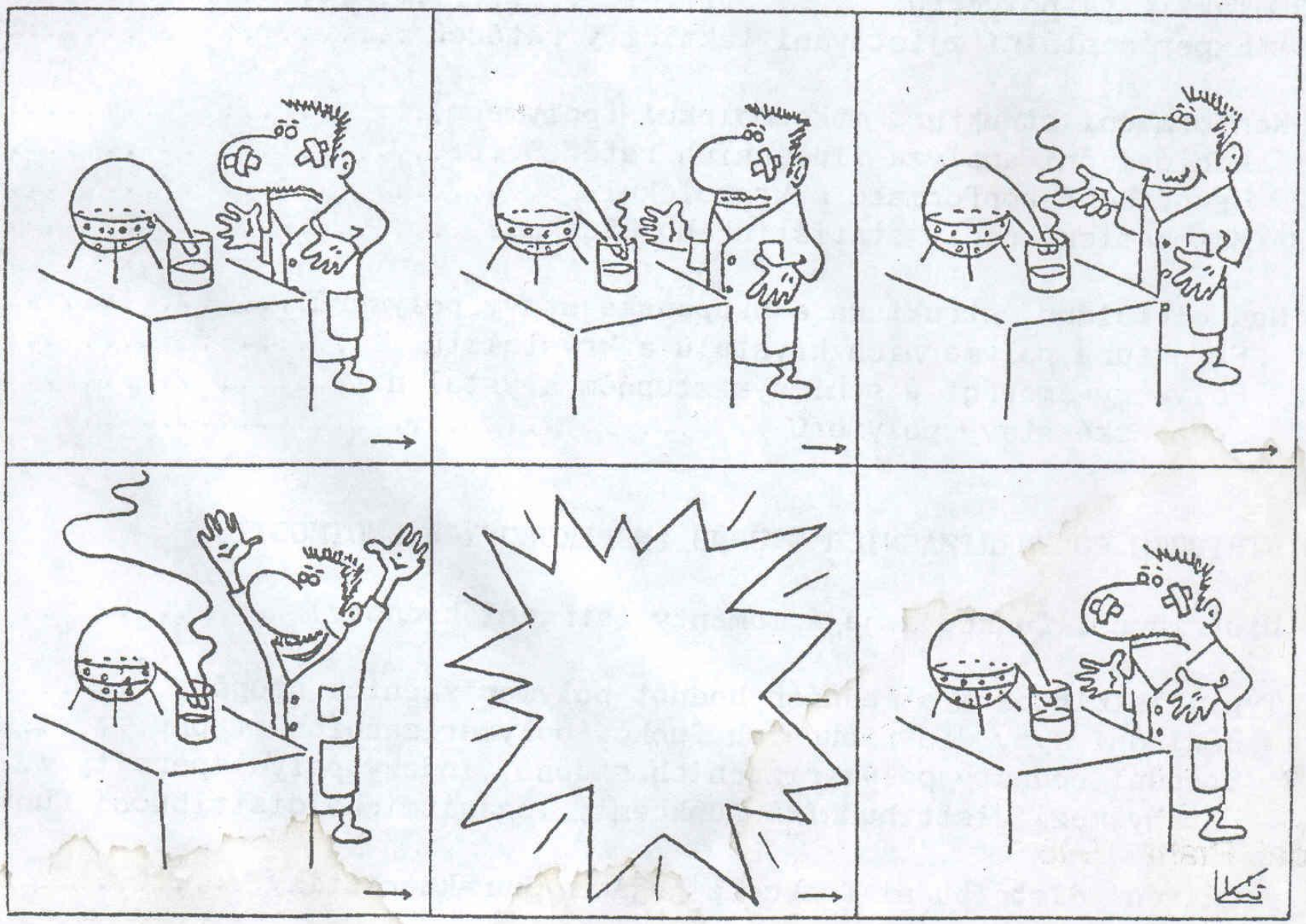


* Místo OPD mùže být použit 3-chlor-2-oxepanon- výsledný makrocyklus je naznaèen na obr 3.



Optoelektronické vlastnosti - spolupráce s ÚMCH AV ČR
skupina Dr. J. Pflegera

Katalýza, adsorpce - spolupráce s ÚFCH AV ČR
skupina Prof. J. Čejky



Research Worker's Fate

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