

MIKROSKOPIJA NA TEKSTILNO-TEHNOLOŠKOM FAKULTETU SVEUČILIŠTA U ZAGREBU

dr.sc. Sandra Bischof Vukušić, prof.

Sveučilište u Zagrebu Tekstilno-tehnološki fakultet
Zamjenica voditelja: Textile Science Research Center
<http://www.ts-rc.eu>



FE-SEM Mikroskop, Mira, Tescan



SEM je nabavljen 2009.g.
sredstvima projekta

FP7-REGPOT-2008-1-
229801:T-Pot

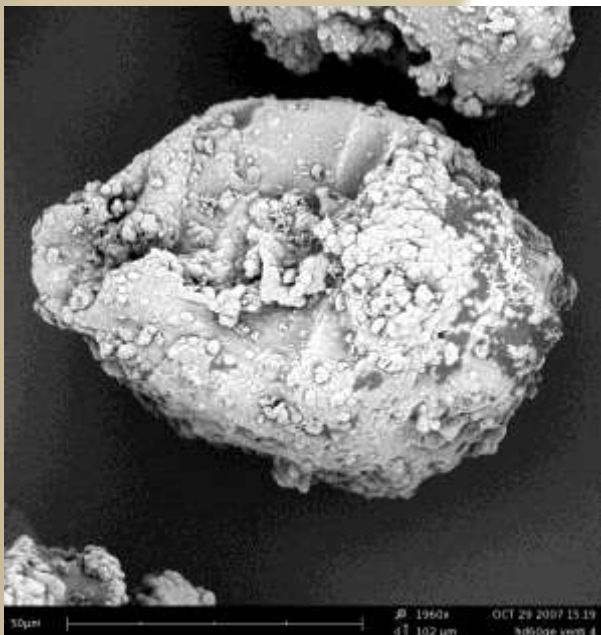


Primjena SEM-a na TTF-u

Područja primjene:

- ◆ Proizvodnja vlakana
- ◆ Površinske obrade:
 - ◆ Plazma
 - ◆ Sol-gel obrade
 - ◆ Mikrokapsulacija
 - ◆ Naslojavanje čestica





NANOTEHNOLOGIJA

= inovacijski pokretač u mnogim industrijskim granama, pa tako i u tekstilnoj industriji.

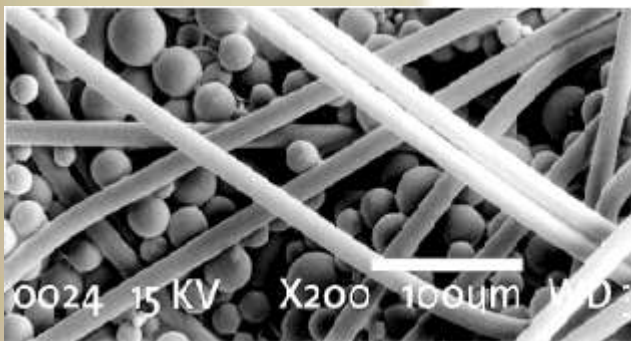
Izrada NANOSTRUKTURA

na vlaknima i

u vlaknima ili tekstilijama

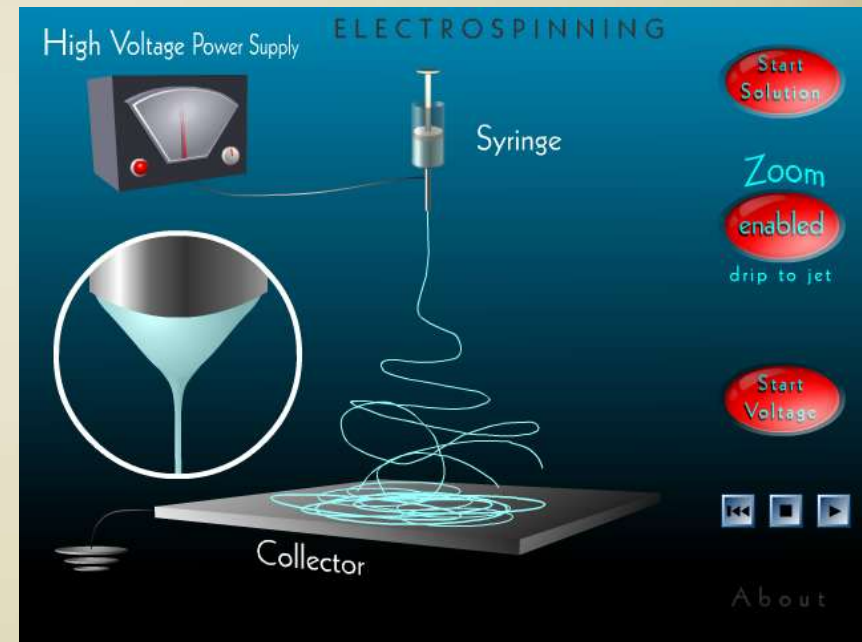
može se podijeliti u dvije skupine:

1. **Proizvodnja vlakana**
2. **Površinske obrade tekstilija**



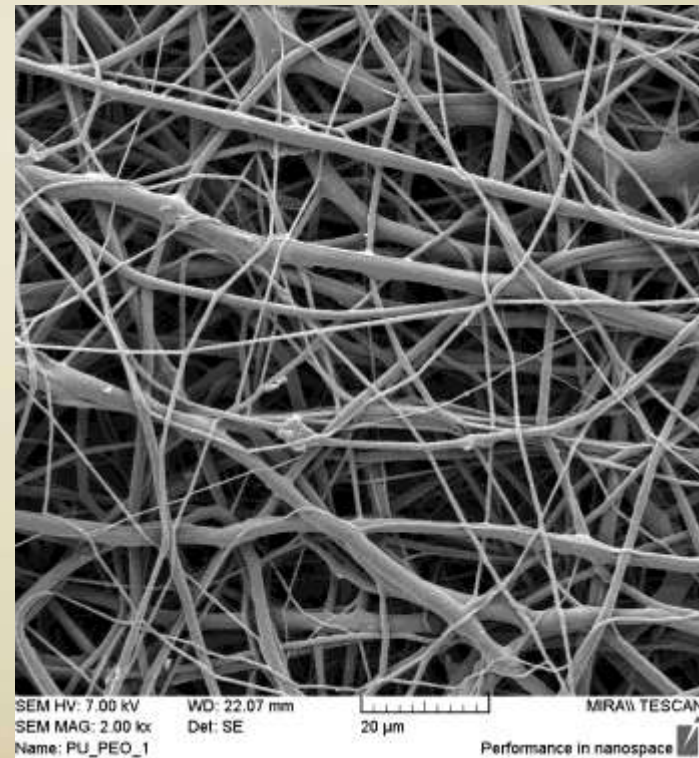
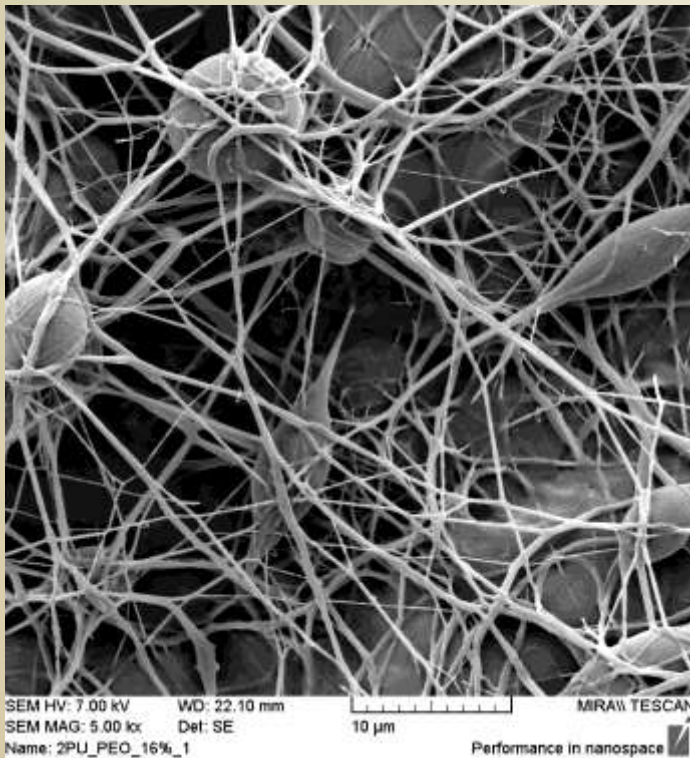
Proizvodnja vlakana

- **Elektroispredanje:** jedna od tehnologija koja se primjenjuje na TTF-u za proizvodnju nanovlakana
- Primjena:
 - **Medicina** (implatanti)
 - **Filteri**
 - **Netkane tekstilije.**



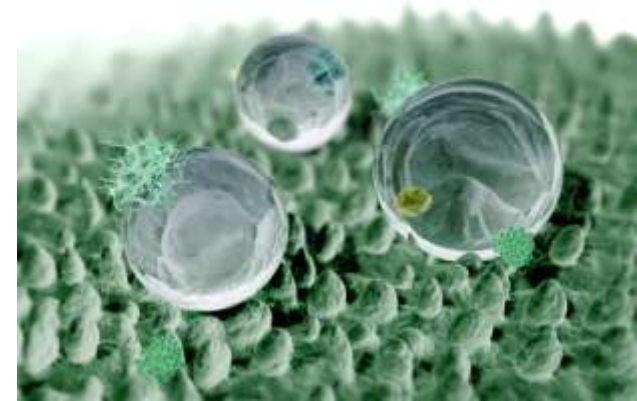
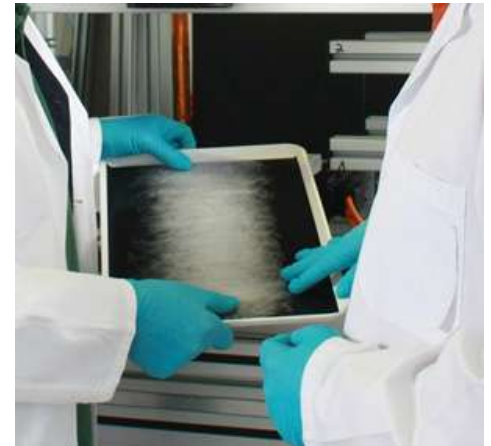
ELEKTROISPREDANJE

- Zavod za temeljne prirodne i tehničke znanosti, Laboratorij za elektroispredanje, Dr.sc. Budimir Mijović, prof.



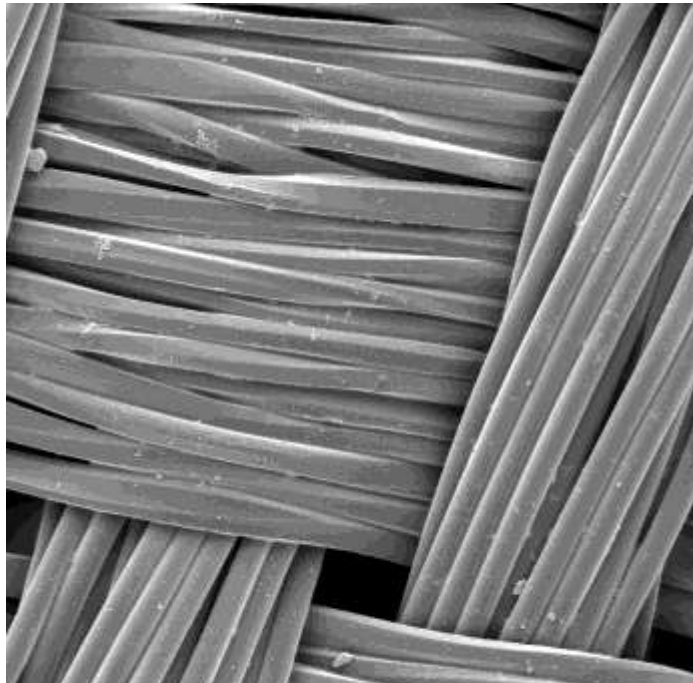
Površinske obrade tekstilija

- Tekstilne površine mogu se površinski funkcionalizirati ili aktivirati:
 - ⇒ Obradom s plazmom
 - ⇒ Naslojavanjem nanočestica (npr. Ag čestice)
 - ⇒ Mikro i nanostrukturiranjem (npr. tzv. lotos efekt)
 - ⇒ Sol-gel postupkom
 - ⇒ Mikrokapsuliranjem (Phase change materials – PCM)

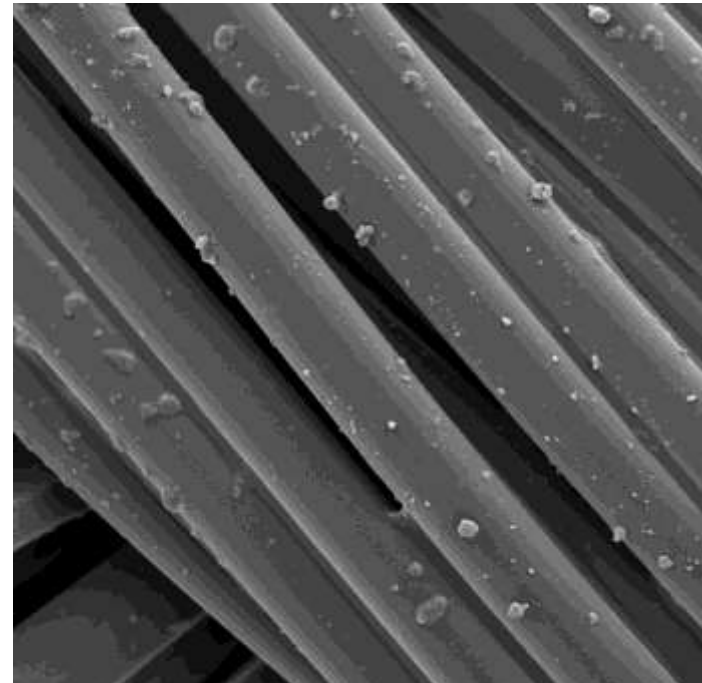


SOL-GEL

- Zavod za materijale, vlakna i ispitivanje tekstila, Laboratorij za fizikalno-kemijska ispitivanja, Dr.sc. Maja Somogy Škoc.



SEM HV: 10.00 kV
SEM MAG: 500 x
Name: PES_#_1
WD: 12.04 mm
Det: SE
100 µm
MIRA\\ TESCAN
Performance in nanospace

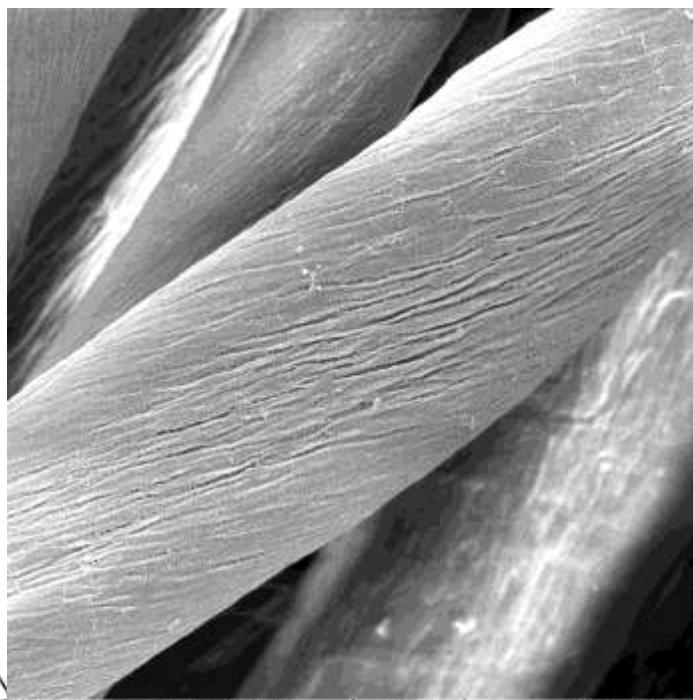


SEM HV: 10.00 kV
SEM MAG: 1.50 kx
Name: PES_#_2
WD: 12.03 mm
Det: SE
20 µm
MIRA\\ TESCAN
Performance in nanospace

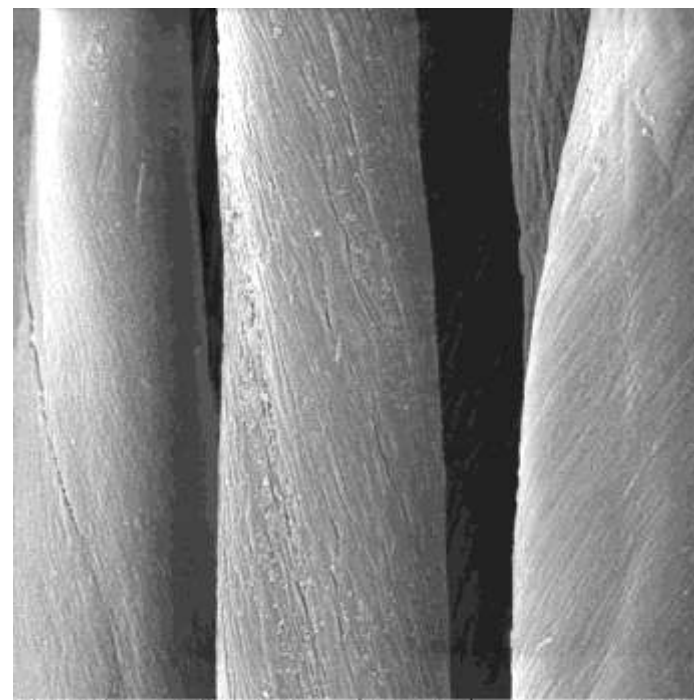


PLAZMA

- Zavod za materijale, vlakna i ispitivanje tekstila, Laboratorij za obradu plazmom, Dr.sc. Sanja Ercegović Ražić.



SEM HV: 7.00 kV WD: 21.70 mm
SEM MAG: 7.00 kx Det: SE
Name: Pam_kisik_SA_PF_3
MIRA TESCAN
5 µm
Performance in nanospace

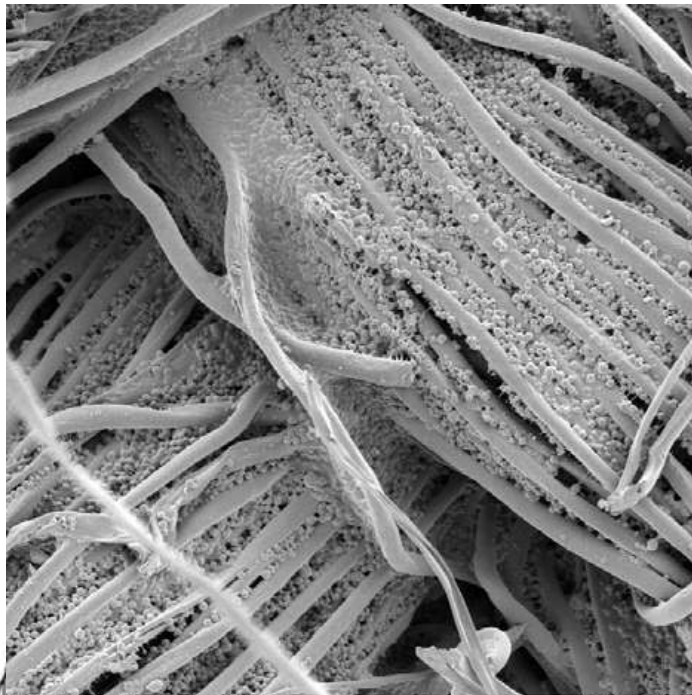


SEM HV: 7.00 kV WD: 21.77 mm
SEM MAG: 7.00 kx Det: SE
Name: Pam_kisik_SA+SHP_TF_3
MIRA TESCAN
5 µm
Performance in nanospace

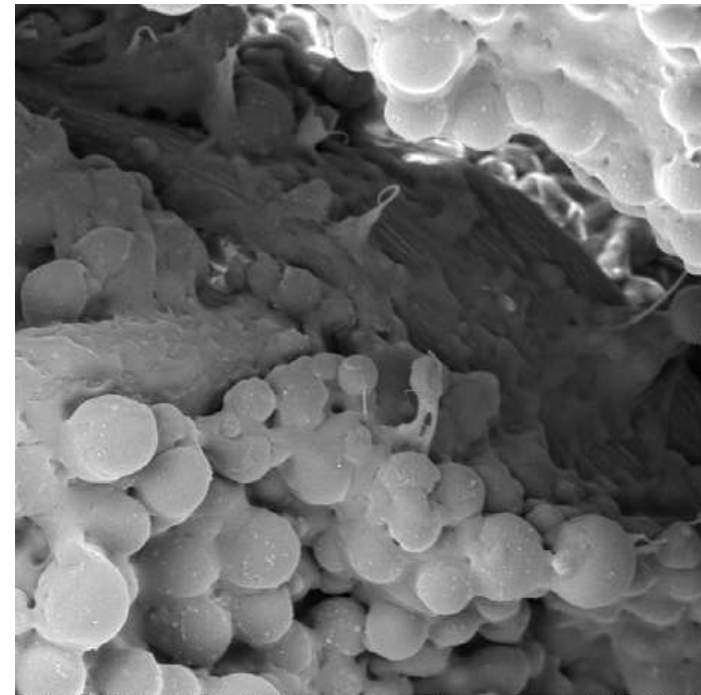


MIKROKAPSULIRANJE

- Zavod za tekstilno-kemijsku tehnologiju i ekologiju, Dr.sc. Sandra Bischof Vukušić.



SEM HV: 7.00 kV WD: 8.567 mm
SEM MAG: 500 x Det: SE
Name: 1_7
MIRA\\ TESCAN
100 µm
Performance in nanospace

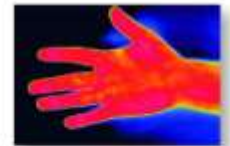
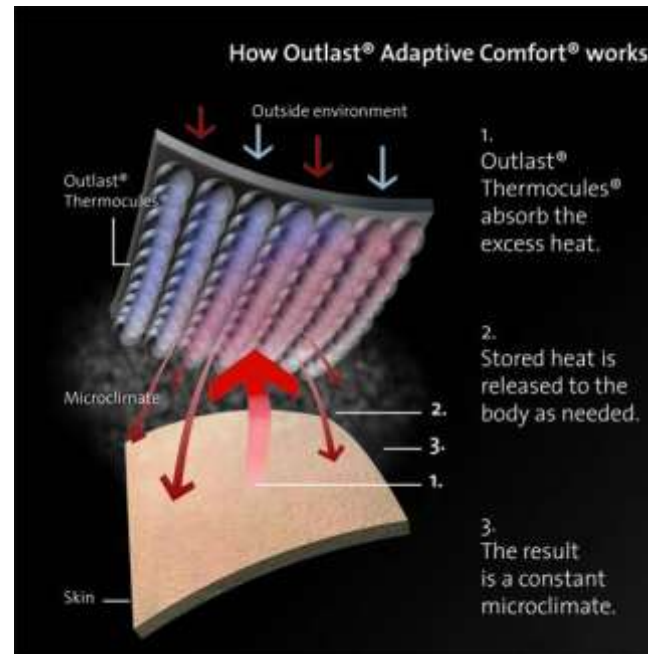


SEM HV: 7.00 kV WD: 8.790 mm
SEM MAG: 5.00 kx Det: SE
Name: 4_10
MIRA\\ TESCAN
10 µm
Performance in nanospace

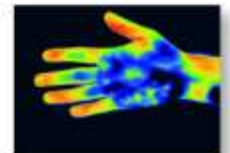


⇒ Upotreba FE SEM-a omogućuje direktno promatranje nevodljivih uzoraka u njihovom prirodnom obliku pri čemu uspješno ulazimo u budući svijet nano i mikrotehnologije.

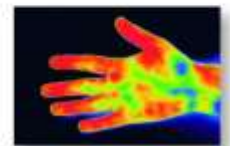
- ⇒ Zavod za temeljne, prirodne i tehničke znanosti
- ⇒ Zavod za vlakna, materijale i ispitivanje tekstila
- ⇒ Zavod za tekstilno-kemijsku tehnologiju i ekologiju
- ⇒ Zavod za primijenjenu kemiju



Picture: Normal tempered hand (before the test)



Picture Cooled hand. Glove without - and with (below) Outlast® material.



T-Pot project

T-Pot aims to reinforce research potentials of Faculty of Textile Technology (TTF) in order to strengthen university sector to become one of the components of national innovation. The goals are to develop the capacity for breakthrough research leading to innovative textile and textile related products contributing in this way to local industry.

Project activities:

Development of strategic partnerships with well established research institutions and SMEs from Germany, Spain, Poland and Italy (STFI, Leitat, INFMP and GZE).



Cooperation scheme between Faculty of Textile Technology (TTF), its Textile Science Research Centre (TSRC)

Partnering institutions

STFI (DE),
Leitat (ES),
INF (PL),
GZE (IT)
Croatian Chamber of Economy (CCE)
Croatian Employers' Association (CEA)

Reinforcement of human and material potentials

- 3 new PhD students are employed and trained at 3 prestigious research institutions
- 1 expert is employed for the period of 1 year.
- top scientists are attracted to the country for exchange of know-how and guidance of Croatian researchers and manufacturers
- 2 sets of top-level equipment are purchased for:

SEM (Scanning Electron Microscopy): FESEM

TA (Thermal Analyses): DSC, TGA, FTIR with TG-IR interface.

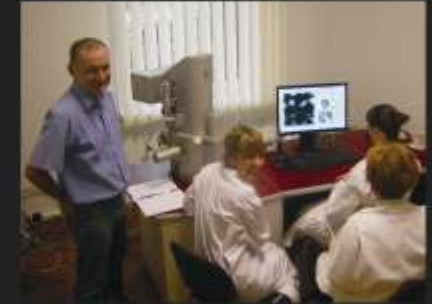


Researchers employed by the T-Pot at the Department of Textile Chemistry & Ecology



First research secondment (6 months) in EMPA - St. Gallen, in group of Additives & Chemistry.

SEM allows researching the structures invisible to human eye by magnification up to 1,000,000 times.



Instrument SEM-FE MIRA II LMU model Tescan, purchased by the T-Pot project



Set of instruments for thermal analyses, model Perkin Elmer, purchased by the T-Pot project