



Aalto University  
School of Chemical  
Technology

# CHEM-E2120 –Fibres and fibre products

## Laboratory exercises

16.9.2021

University Lecturer Eero Hiltunen

# Target of laboratory exercises

- Get familiar with fibers
  - Especially cellulosic fibers
- Get familiar with some basic analysis tools
  - Especially microscopy
- Scientific/technical analysis
- Group work skills
- Affects 25% to the course grade
  - *Exam is 75%*

# Info on laboratory exercises

- Responsible person:  
University Lecturer Eero Hiltunen  
Second teacher: M.Sc. Antti Koistinen
- Each group receives unknown samples of fibres  
~5 samples per group
  - Mostly cellulosic fibres
- Group work – ~6 persons per group
  - 0,5 day in lab (~4 hours)
  - Questions answered during lab by group (in MyCourses)

# Info on Covid 19

- In this course we work in small labs
  - Masks are used in lab
  - Aalto provides masks
  - (Good idea is to have own backup mask)



# Fiber analysis methods applied

- Light microscope
- Scanning Electron Microscope - SEM
- kajaani FibreLab

# Light microscope

- Teacher: Eero Hiltunen, Antti Koistinen
- General appearance of fibres, dimensions roughly, overview of fibre wall etc.
- Photos for analysis
- Room 238, Puu1



# Scanning Electron Microscope (SEM)

## Phenom Pure

- Teacher: Eero Hiltunen, Antti Koistinen
- Puu1 building  
Room 340
- General appearance of fibres, dimensions more accurately (high magnifications), details of fibre wall, etc.
- Photos for analysis



# kajaani FibreLab

- Teacher: Antti Koistinen, Eero Hiltunen
- Measurement of fibre dimensions
  - E.g. average length + width + cell wall thickness + fines
    - Also distributions
  - Note! max fibre length is 7 mm
- Based on image analysis of thousands of photos
  - Flow through narrow channel
  - Statistically reliable
- **Room 137, Puu1**





# Questions answered during lab

- Group answers questions together
- Questions answered during lab
  - MyCourses quizz
- More info will come soon to MyCourses

## More info

- Literature search – to compare your results
  - Computer
    - Google Scholar, Aalto library pages
- KnowPap and KnowPulp virtual learning environments
  - **know.aalto.fi**
  - Functions at Aalto ip space (campus, vpn):
    - \* Kem Chemistry dep computer classes
    - \* Student computers at Puu building (227B)

# Lab contact info

- Dr. Eero Hiltunen
  - Room 324, Puu1 building
    - \* eero.hiltunen@aalto.fi
    - \* phone: +358-50-344 2084
- Doctoral student Antti Koistinen
- Prof. Thad Maloney (thaddeus.maloney(at)aalto.fi)
  - General discussion of analysis, fibers etc.
  - Room 219, Puu1 building

# How to start

- Info will come to MyCourses soon
- Some questions – ask Eero  
([eero.hiltunen\(at\)aalto.fi](mailto:eero.hiltunen@aalto.fi))