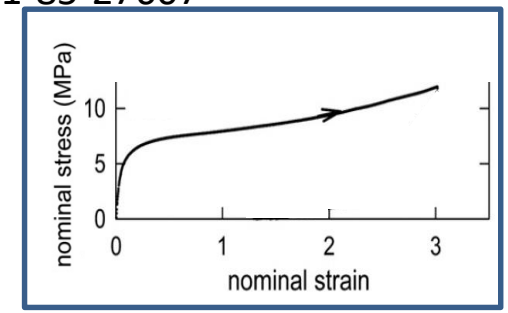
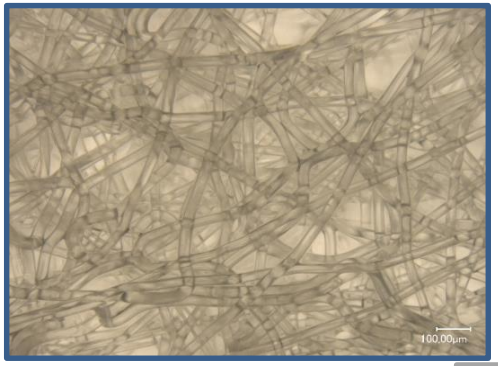
Charakterisierung der mechanischen Eigenschaften eines semielastischen Vliesstoffes

Betreuer: M.Sc. M. Redel, michael.redel@fau.de; Raum 1.86; 09131-85-27607
Prof. Dr. Dirk W. Schubert



Inhalt der Arbeit:

- Zugversuche an Vliesstoffen
- Mikroskopie (Licht/Laser/REM) zur Faserdurchmesserbestimmung
- Molekulargewichtsmessungen (GPC)

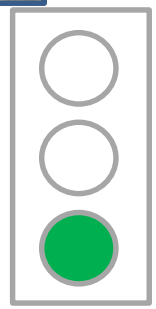


Ziele:

Identifizierung des Einflusses der Herstellungsparameter auf die mechanischen Eigenschaften, die Faserdurchmesserverteilung und das Molekulargewicht von Vliesstoffen

Beginn: Januar 2019

Status

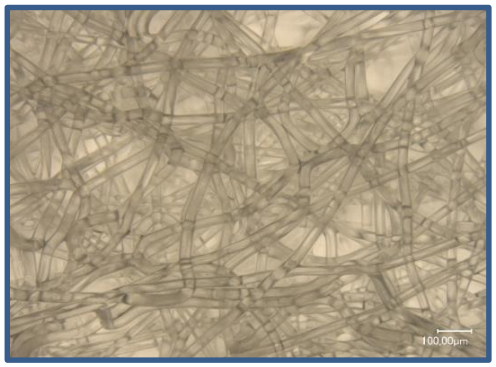


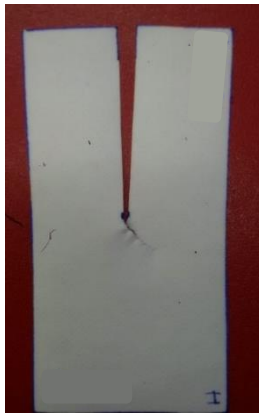
Charakterisierung der mechanischen Eigenschaften eines semielastischen Vliesstoffes

Betreuer: M.Sc. M. Redel, michael.redel@fau.de; Raum 1.86; 09131-85-27607
Prof. Dr. Dirk W. Schubert

Inhalt der Arbeit:

- Weiterreißversuche (Zugversuch) an Vliesstoffen
- Mikroskopie (Licht/Laser/REM) zur Faserdurchmesserbestimmung
- Kalandrierung von Vliesstoffen



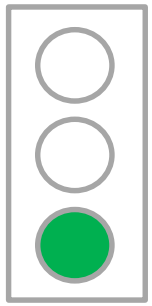


Ziele:

Identifizierung des Einflusses des Faserdurchmessers und der Herstellungsparameter auf die Weiterreißfestigkeit von kalandrierten und unkalandrierten Vliesstoffen

Beginn: Januar 2019

Status

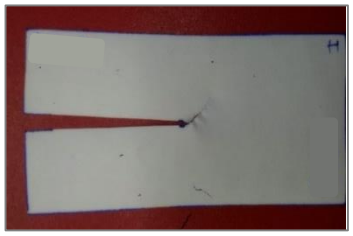


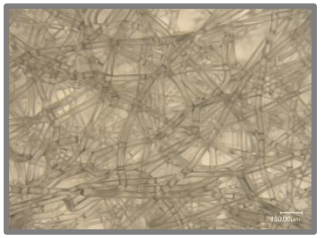
Charakterisierung der mechanischen Eigenschaften eines semielastischen Vliesstoffes

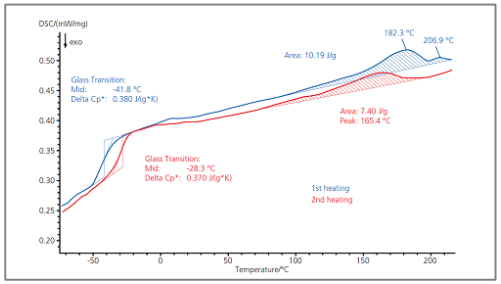
Betreuer: M.Sc. B. Wölfel, bastian.woelfel@fau.de; Raum 1.94; 09131-85-28709
Prof. Dr. Dirk W. Schubert

Inhalt der Arbeit:

- Weiterreißversuche + Zugversuch an Vliesstoffen
- Mikroskopie (Licht/Laser) zur Faserdurchmesserbestimmung
- DSC Charakterisierung





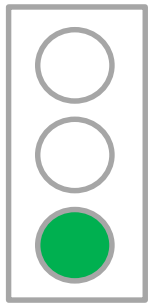


Ziele:

Identifizierung des Einflusses von Prozessänderungen auf die optischen, mechanischen und thermischen Eigenschaften von Vliesstoffen

Beginn: Februar 2019

Status



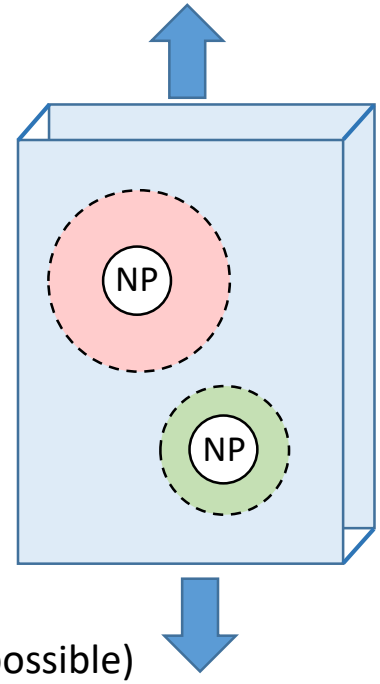
Determining the Interphase Thickness in a Polymer Nanocomposite

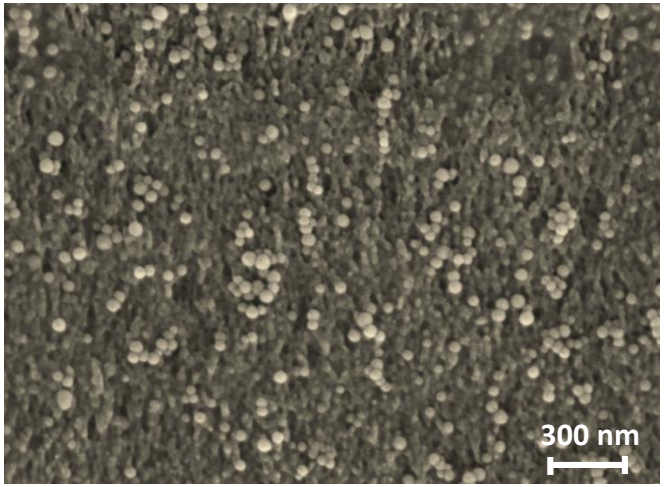
Betreuer: Siegfried Werner, Dr. Joachim Kaschta, Prof. Dr. D. W. Schubert
Martensstrasse 7, Raum 190, siegfried.werner@fau.de

The aim of this work is to identify the amount of distorted matrix („interphase“) surrounding a nanoparticle in a polymer matrix. The amount of interphase is responsible for the unique properties of polymer nanocomposites. Therefore, tensile tests are conducted and the variation in yield stress with the amount and surface functionalization of the nanoparticles can be used to determine the thickness of the interphase.

Experiments:

- Compounding
- Tensile testing
- SEM images
- DSC -> Morphology





PP/SiO_2 SEM cross section

Starting: March 2019
Language: **German** (English also possible)

Topic: Slip in crosslinked polyethylene

Background:

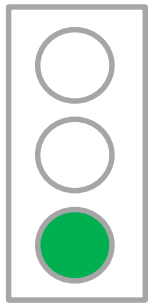
Polyethylenes are frequently crosslinked to improve their thermo-mechanical properties. Crosslinking can be achieved by irradiation, peroxide and silane based mechanism. LSP has developed together with industry a rheological test to characterize the crosslinking density. In some cases a dependence of the results on sample thickness can be observed, which may be explained by slip mechanisms.

Fields of work:

- Literature survey on slip of elastomers and gels (highly elastic materials)
- Rheological measurements of various PEX-samples
- DSC and GPC evaluation of thermal and molecular data

Supervisor: Dr. Joachim Kaschta

Status

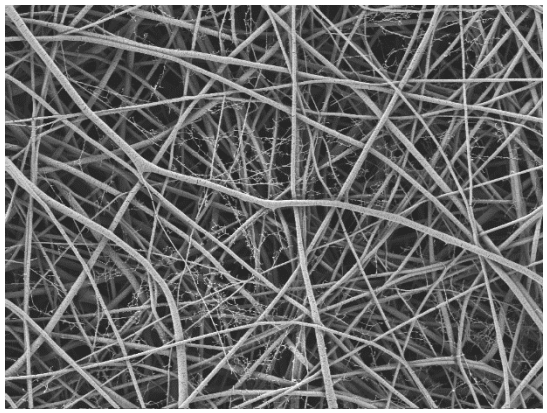


Einfluss der Polymerlösung auf das Electrospinning

Betreuer: M.Sc. M. Himmler, marcus.himmler@fau.de; Raum 1.86; 09131-85-27607
Prof. Dr. Dirk W. Schubert

Inhalt der Arbeit:

- Charakterisierung unterschiedlicher Polymerlösungen
  - Verschiedene Lösemittelsysteme
  - Polymerkonzentration
  - Blends
- Elektrospinning von ungeordneten Nanofasern
- REM Mikroskopie der Nanofasermembranen

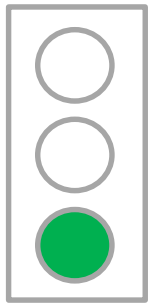


Ziele:

- Identifizierung von Parametern der Polymerlösung für den Elektrospinningprozess

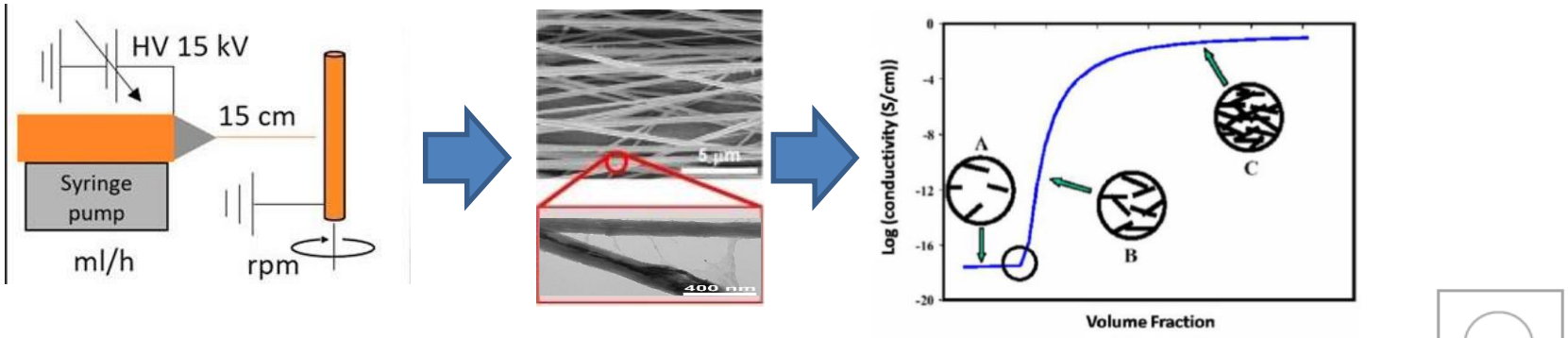
Beginn: ab März 2019

Status



Supervisor:
M.Sc. Muhammad Azeem Munawar, muhammad.munawar@fau.de;
Raum 1.76; 09131-85-27741
Prof. Dr. Dirk W. Schubert

Aim: Production of the conductive fibers by electrospinning and estimation of percolation threshold using electro-spun bundle fibers



Beginn: April 2019

Status

Schmelzelektrospinning von Polypropylen

Betreuer: M.Sc. M. Himmler, marcus.himmler@fau.de; Raum 1.86; 09131-85-27607
Prof. Dr. Dirk W. Schubert

Inhalt der Arbeit:

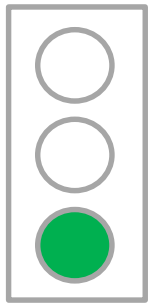
- Optimierung des Spinnprozesses von ungeordneten Nanofasern aus PP
- Transfer zu ausgerichtet gesponnenen Nanofasern auf dem Radkollektor
- Mikroskopische / mechanische Charakterisierung

Ziele:

- Etablierung eines Melt-Elektrospinningprozesses mit Polypropylen

Beginn: ab April 2019

Status

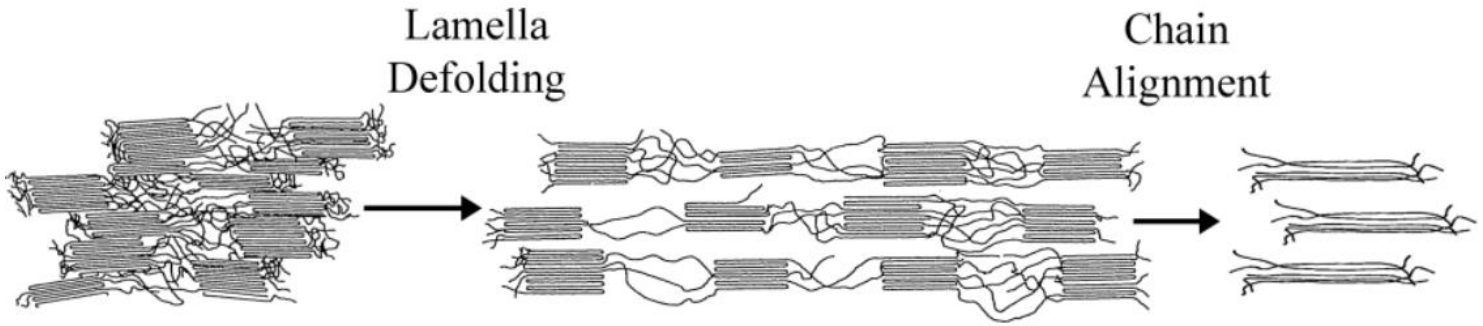


Morphology development in iPP during biaxial orientation and the effect on breakdown strength

POLYMER PHYSICS AND PROCESSING

Betreuer: Siegfried Werner, Dr. Joachim Kaschta, Prof. Dr. D. W. Schubert
Martensstrasse 7, Raum 190, siegfried.werner@fau.de

Biaxially oriented polypropylene is the goldstandard of large area thin film capacitors needed for the energy revolution. During the orientation process the morphology is remodeled to a large extent. The final morphology has a large resistance agains dielectric breakdown. **The aim of this work is to monitor the morphology chanes in iPP at different steps during biaxial orientation and identify the morphology parameter governing the breakdown behavior.**



Experiments:

- Extrude iPP as castfilm
- Biaxial orientation of plugs from castfilm

Starting: August 2019
Language: **German** (English also possible)

- Morphology characterization
  - SEM images -> local microstructure
  - WAXS -> integrated microstructure
  - Laser microscope -> surface morphology
- Testing dielectric breakdown behavior