ELECTROSPINNING

- Definition:

Electrospinning is a material fabrication technique that uses an electric charge to create extremely fine fibers, on the order of nanometers. In this technique, a polymeric liquid is subjected to high electrical stress, which produces a repulsive force that stretches and stretches the liquid until a cone-shaped current is formed. When the tension is high enough, the liquid decomposes into very fine fibers that solidify upon contact with a collection surface. These fibers can be used in a wide variety of applications, such as creating materials for tissue regeneration, filter production, electronics manufacturing, and many more.

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ELECTROSPINNING ASSEMBLY

ELECTROSPINNING

INGREDIENTS

- Recycled paper
- PVA (polyvinyl alcohol) polymer solution
- Fine needle
- 10 mls syringe
- INNTEKIE electrospinner equipment
- High voltage generator
- Collector
- Safety equipment: Safety glasses, gloves and lab coats should be used to protect themselves during the process.

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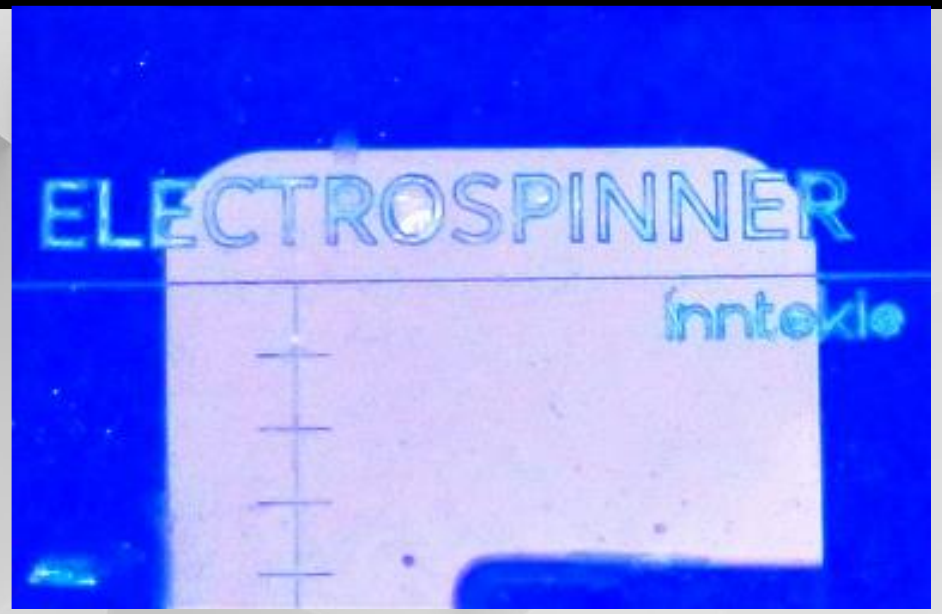
ELECTROSPINNING

Time for the process

- Total process time 6 hours
- Dilution of PVA (polyvinyl alcohol) in cold 40 minutes
- Homogenization of PVA (polyvinyl alcohol) in hot 30 minutes
- Cooling of the homogenized solution 30 minutes
- Enlistment of the INNTEKIE Electrospinner equipment, syringe and receiver paper 15 minutes
- Ignition high voltage generator and power calibration 10 minutes
- Electrospinning process (nano fiber manufacturing) 4 hours



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Step by step

1) Weigh 5 grams of PVA.
2) Measure 50 mls of water
3) Dilute the PVA in cold water (for 40 minutes)
4) Heat the solution to 80°C (for 30 minutes) until the crystals are completely diluted.
5) Let the solution cool for 30 minutes
6) Take 6 milliliters with the syringe (Without using the needle)
7) Place the needle into the syringe and press the plunger until 2 drops of solution come out.
8) Put the recycled paper on the metal base of the Electrospinner INNTEKIE box
9) Take the syringe to the electrospinning box in the hole that best fits
10) Connect the negative pole to the metal plate screw
11) Connect the positive pole to the needle
12) Close the lid
13) Connect the high voltage generator and turn it on (red button)
14) Turn the knob halfway
15) Check the needle every hour

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ELECTROSPINNING ASSEMBLY

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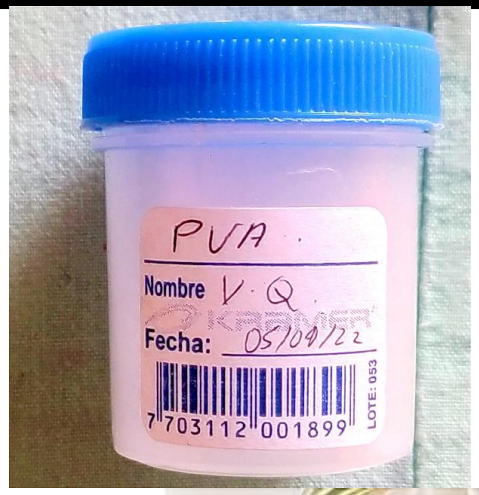
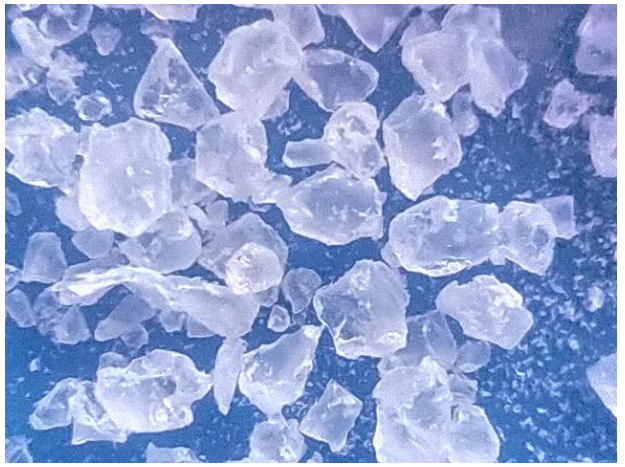
PVA Dilution

- PVA Weighing (5 grs)
- Measure water (50 mls)
- Cold dilution (40 minutes)
- Homogenization at 80°C (30 minutes)
- Let cool solution (30 minutes)
- Feed syringe (6 mls)





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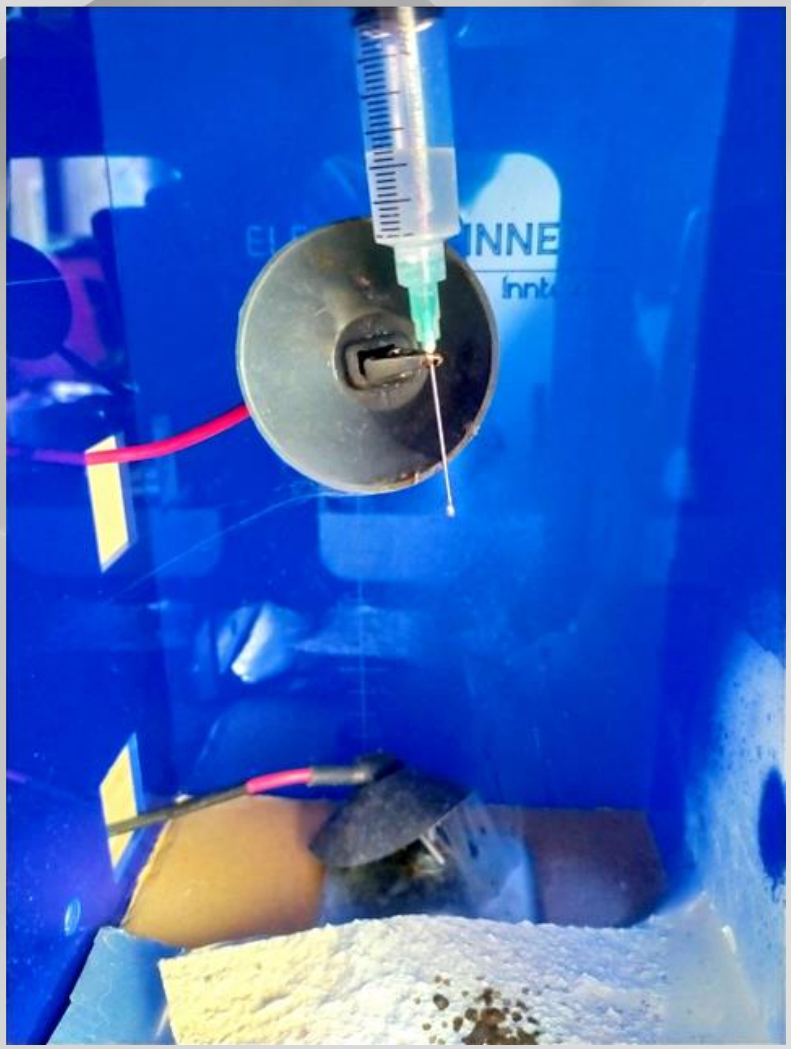
Preparation of Electrospinner INNTEKIE equipment

- Place metal plate on the base
- Connect pole to ground (black color)
- Place aluminum foil
- Place recycled paper on top of aluminum foil
- Locate syringe in hole
- Uncap needle
- Connect positive pole in the needle (red), Purge needle
- Close lid
- Turn on high voltage equipment and turn knob halfway



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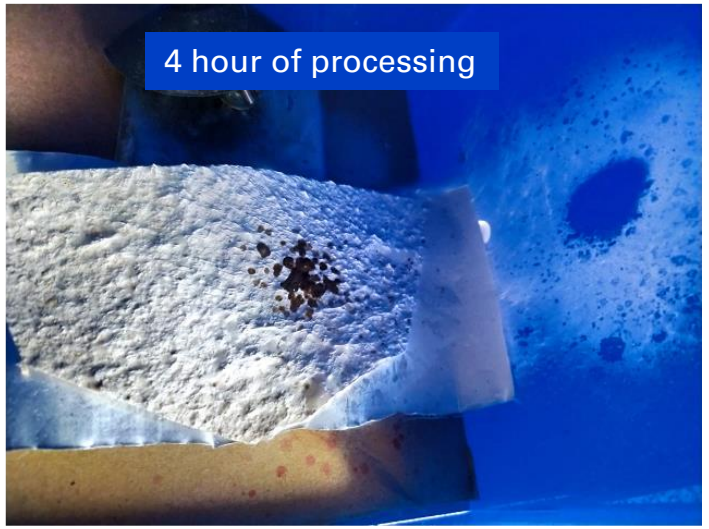
ELECTROSPINNING ASSEMBLY

Spinning

- Observe the drop of solution at the tip of the needle
- Stop process every hour
- Disconnect positive pole (red)
- Change needle and purge
- Locate syringe in hole
- Connect positive pole, close door and turn on equipment
- Repeat the process 4 times (the process takes 4 hours)


1 hour of processing


4 hour of processing