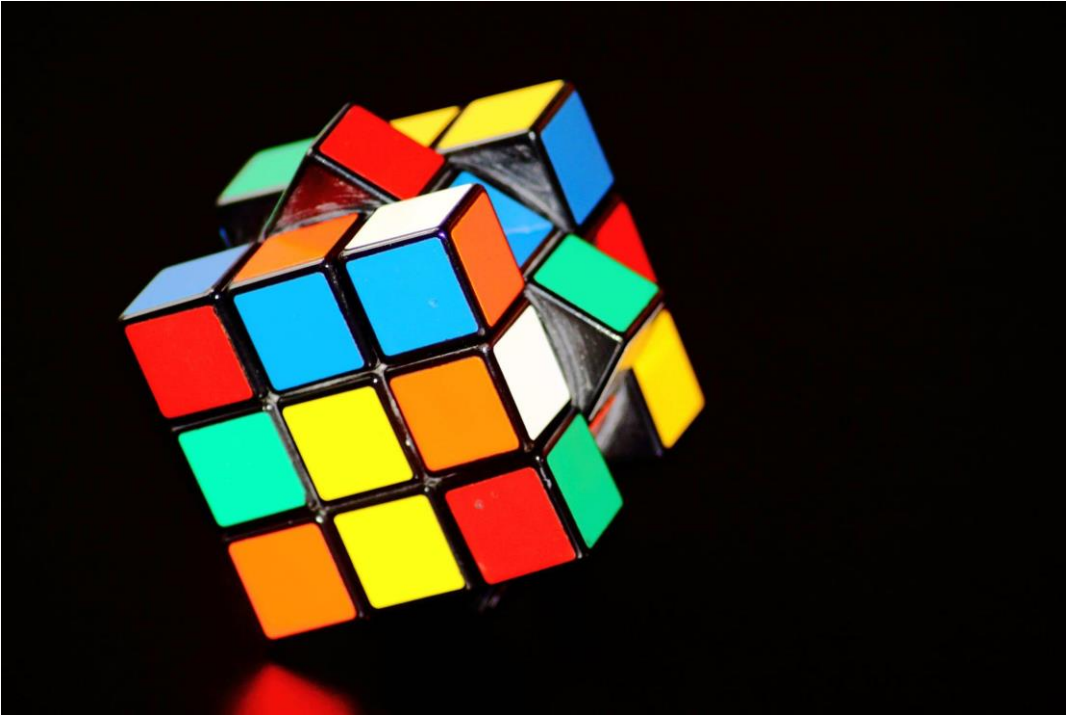


TROUBLESHOOTING AND COMMON ISSUES



Both beginners and expert researcher have experienced common issues exploring the world of nanofibers. Let's see together how to overcome them!

THERE IS NO JET FORMING

- This may be that the voltage is too low, so the electrostatic forces in the polymers are not enough to overcome surface tension in the needle tip, in order to form a jet. You may need a higher voltage.
- Your solution may also be too viscous and unable to flow efficiently

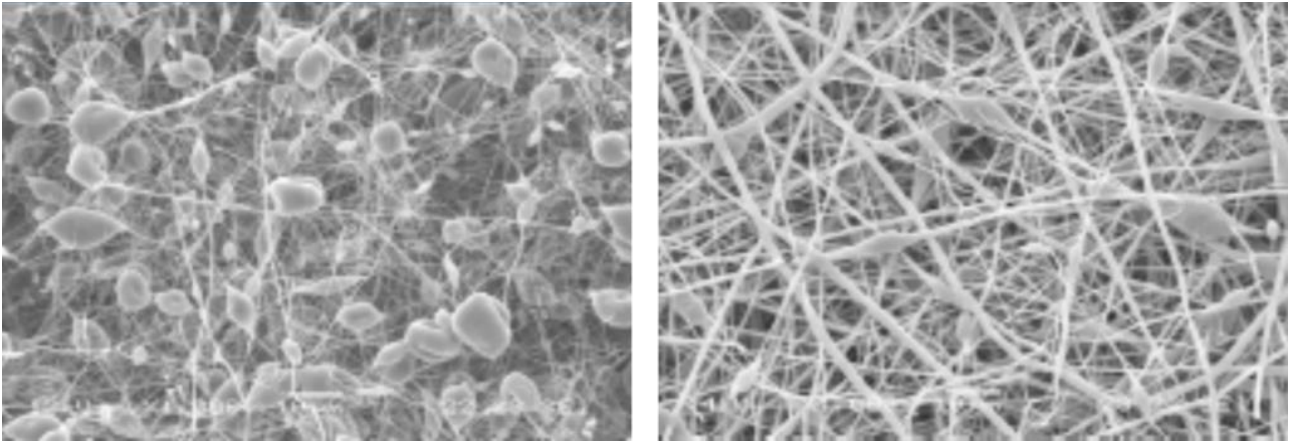
THERE IS BUILD UP AT THE TIP

- The polymer may be too viscous to flow.
- The solvent is too volatile and is evaporating too quickly, causing the polymer to solidify at the tip
- Flow rate is too high, causing a bottle neck through the needle tip.
- The humidity in the electrospinning environment is too high

DROPLETS ARE FORMING

- Flow rate is too high. The fibres are not able to fully dry during the flight time from tip to collector
- Viscosity is too low

- Voltage is too high, causing fibres to overstretch
- There is a slight build up at the tip
- The humidity in the electrospinning environment is too high



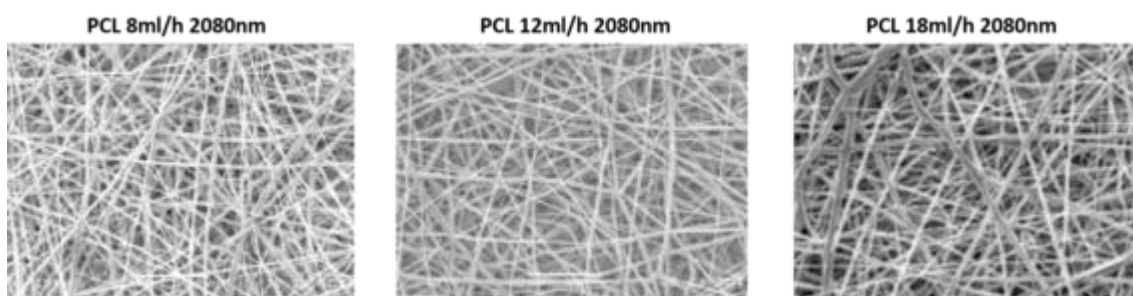
Beading of fibres spun at two different viscosity solutions

FIBERS ARE POORLY ALIGNED/ HAVE UNEVEN DIAMETERS

- Drum RPM is too slow
- Drum is unstable
- Airflow in the electrospinning environment is disrupting the jet
- Fluctuating temperature in electrospinning environment

FIBERS ARE OF UNDESIRED DIAMETERS

- Needle is too close/ too far from the collector
- Voltage is too high/low, effecting the stretching of the fibre. Generally, higher voltages give rise to finer fibres
- Flow rate is too fast/slow
- Temperature is too high/too low. Temperature causes two opposing effects to change the average diameter of the nanofibres: by increases the rate of evaporation of solvent and decreasing the viscosity of the solution



Different diameter electrospun fibres formed from spinning at different flow rates