

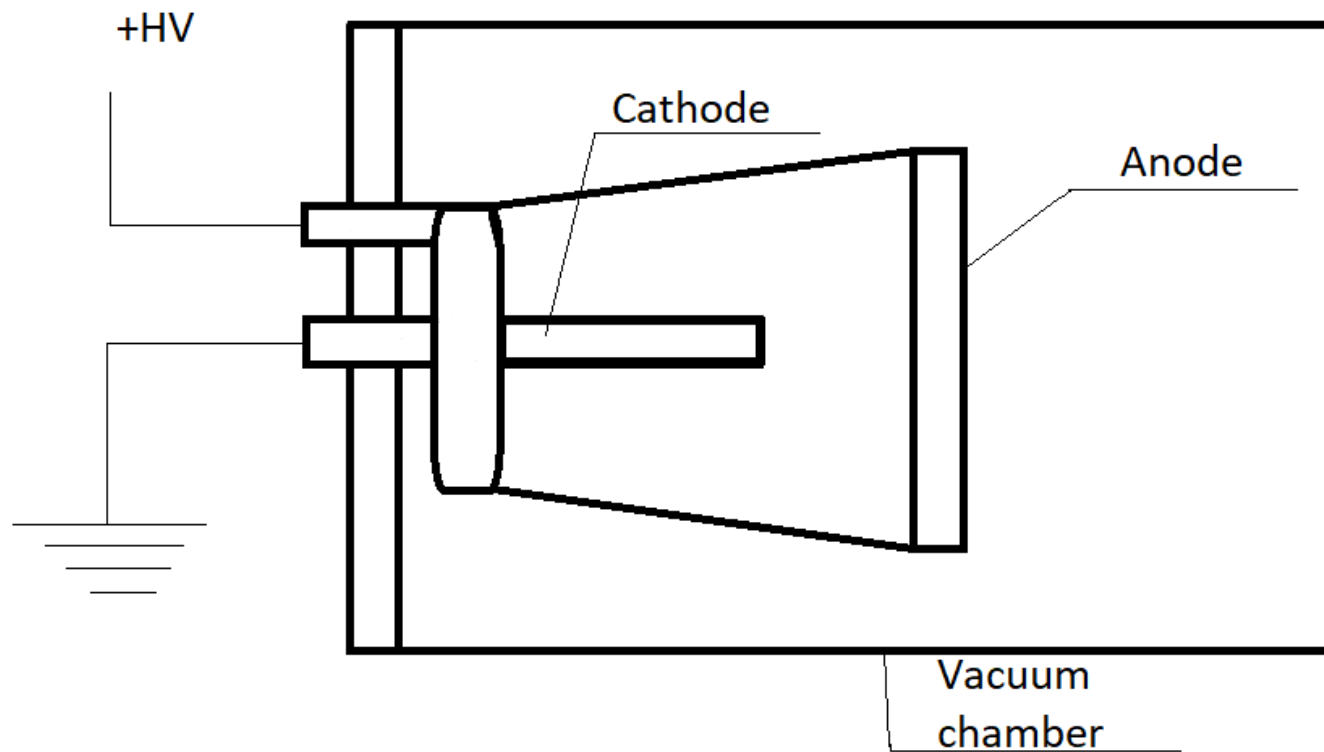
FIELD EMISSION PROPERTIES OF CARBON NANOTUBE THREADS POLYACRYLONITRILE FIBERS

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Aim of the research

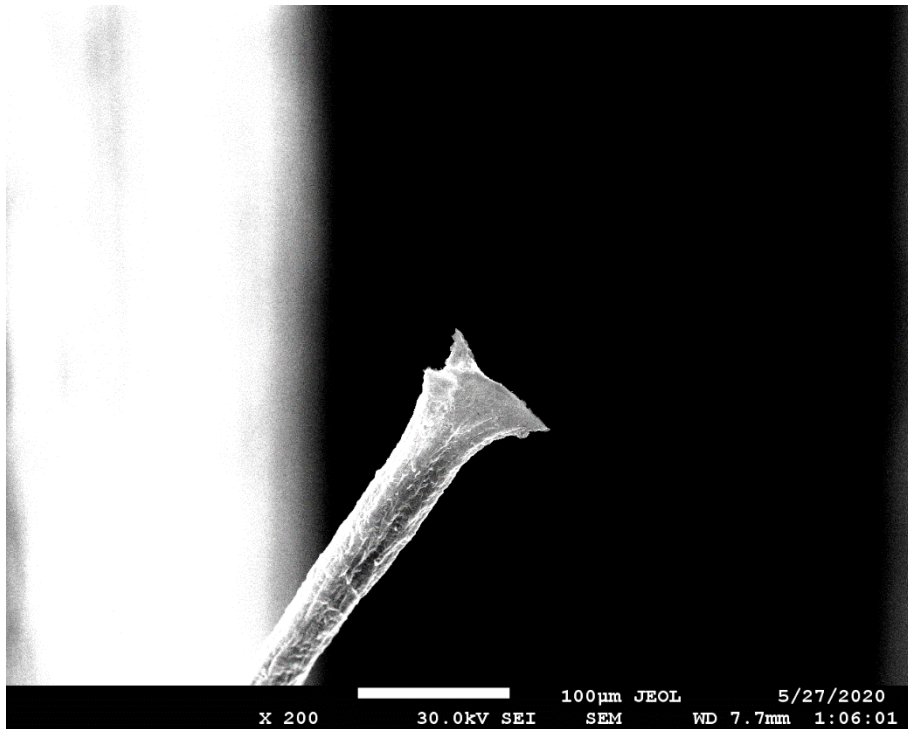
- Test different kinds of carbon materials and determine which one is the best for use as a cathode in a field emission lamp.

Scheme of the test stand

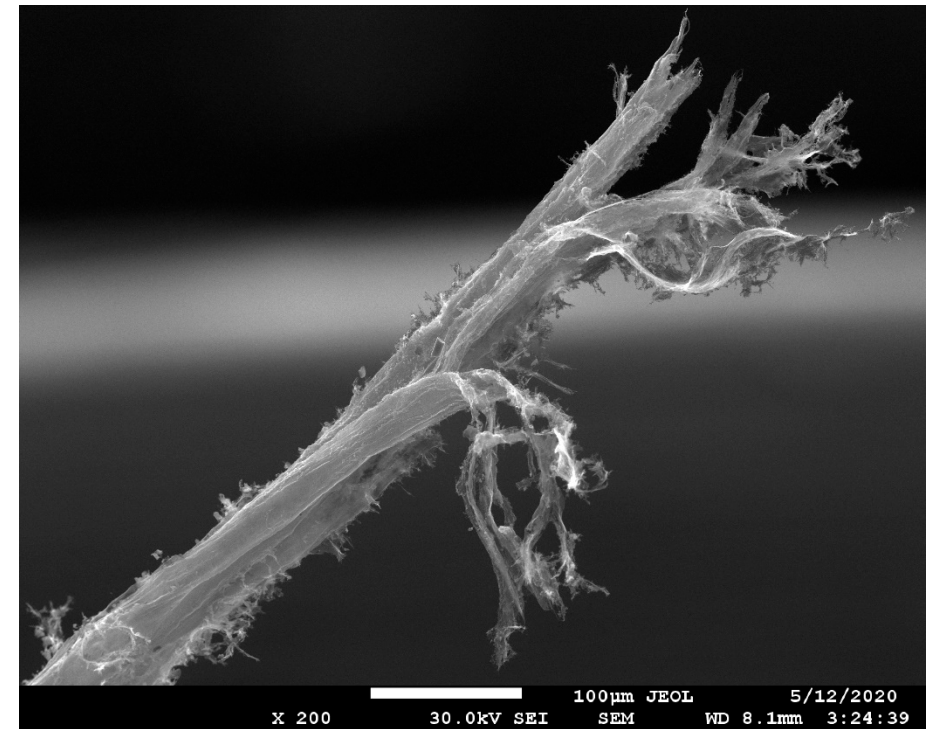


Carbon nanotube thread, \varnothing 20-30 μm

- Before exposition in a vacuum chamber

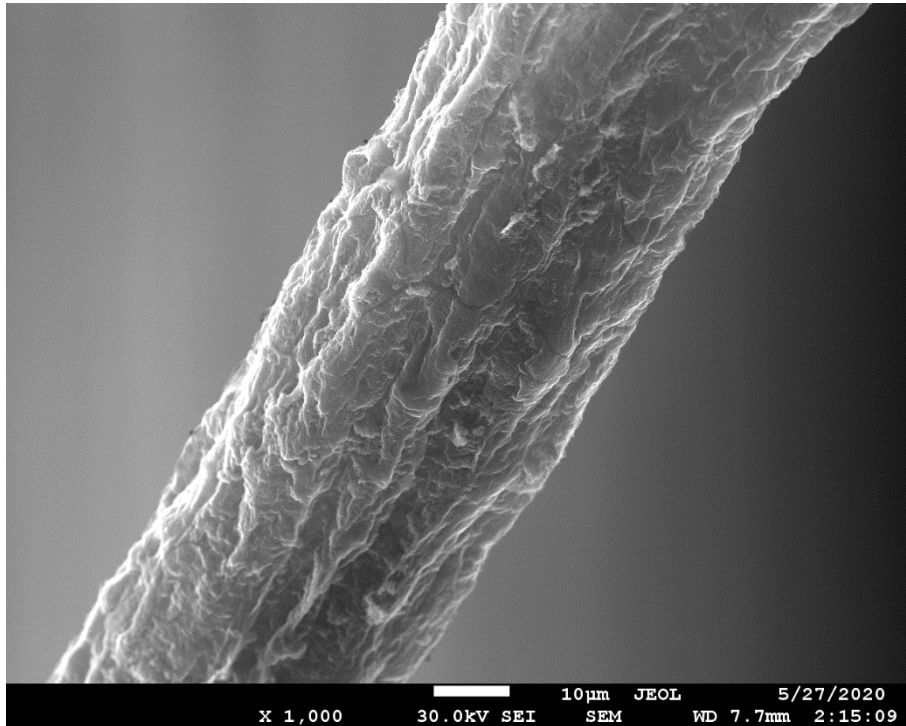


- After exposition in a vacuum chamber

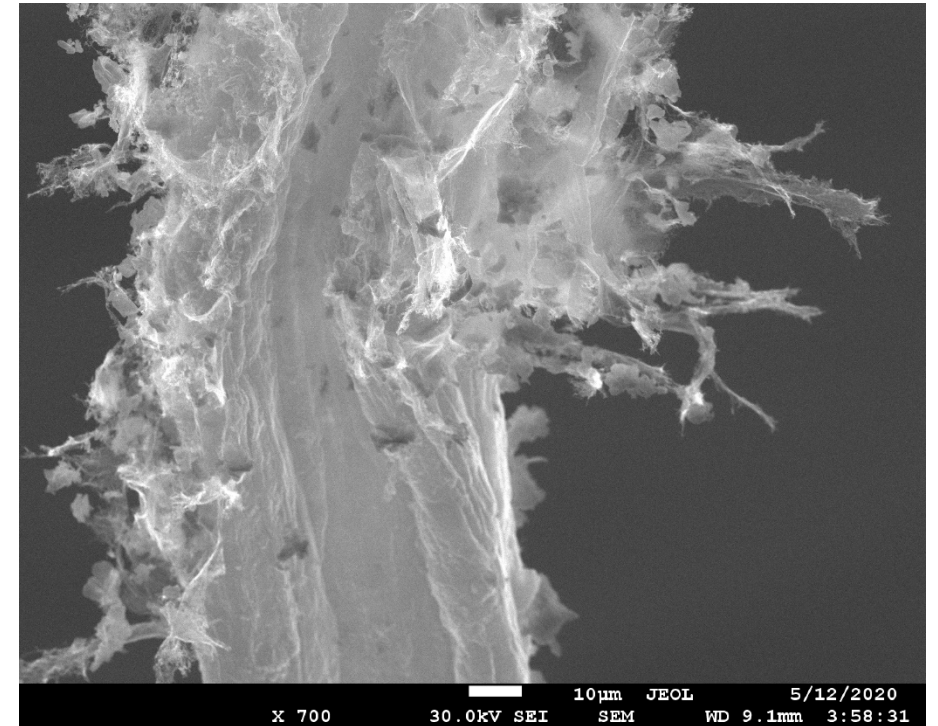


Carbon nanotube thread, \varnothing 20-30 μm

- Before exposition in a vacuum chamber

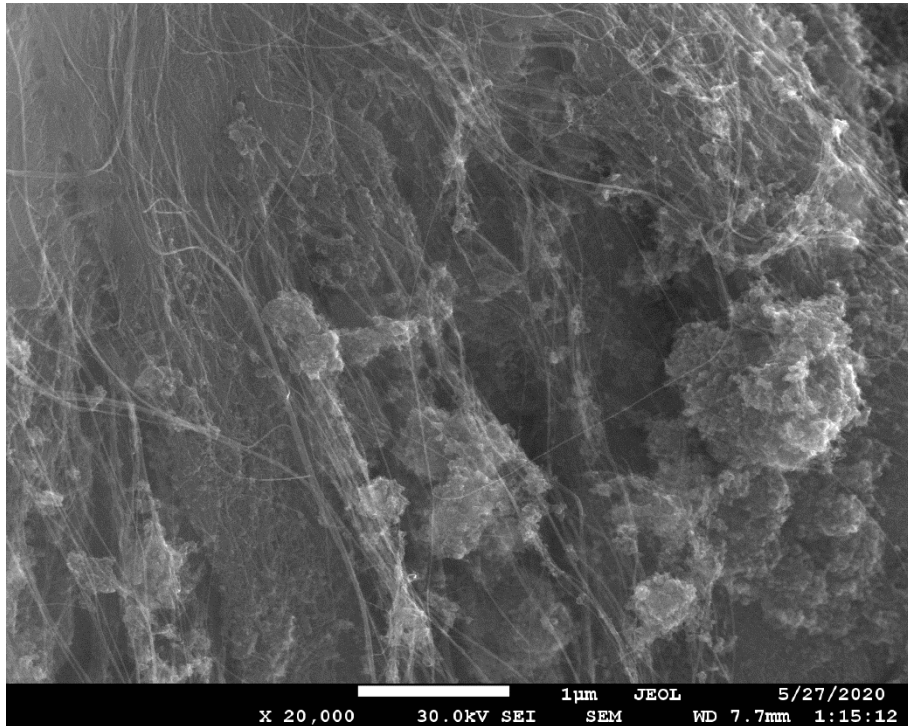


- After exposition in a vacuum chamber

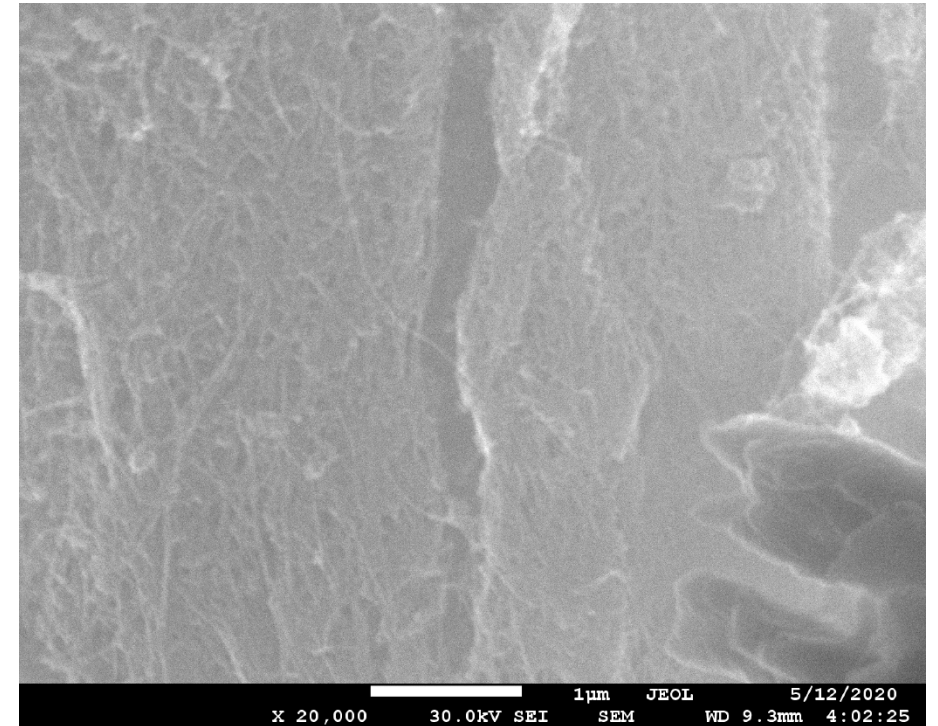


Carbon nanotube thread, \varnothing 20-30 μm

- Before exposition in a vacuum chamber

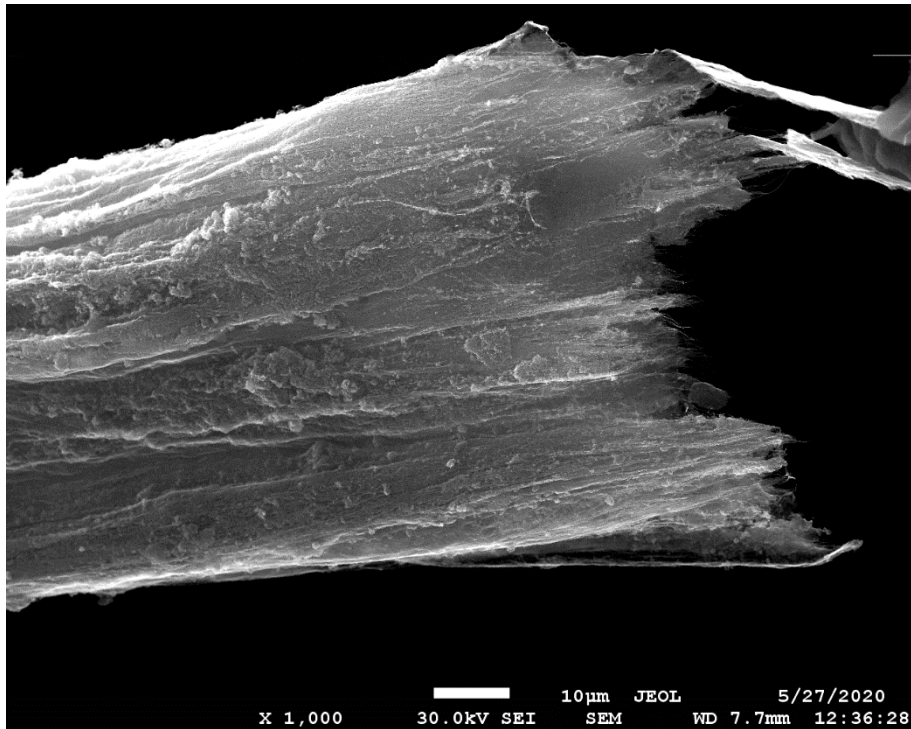


- After exposition in a vacuum chamber

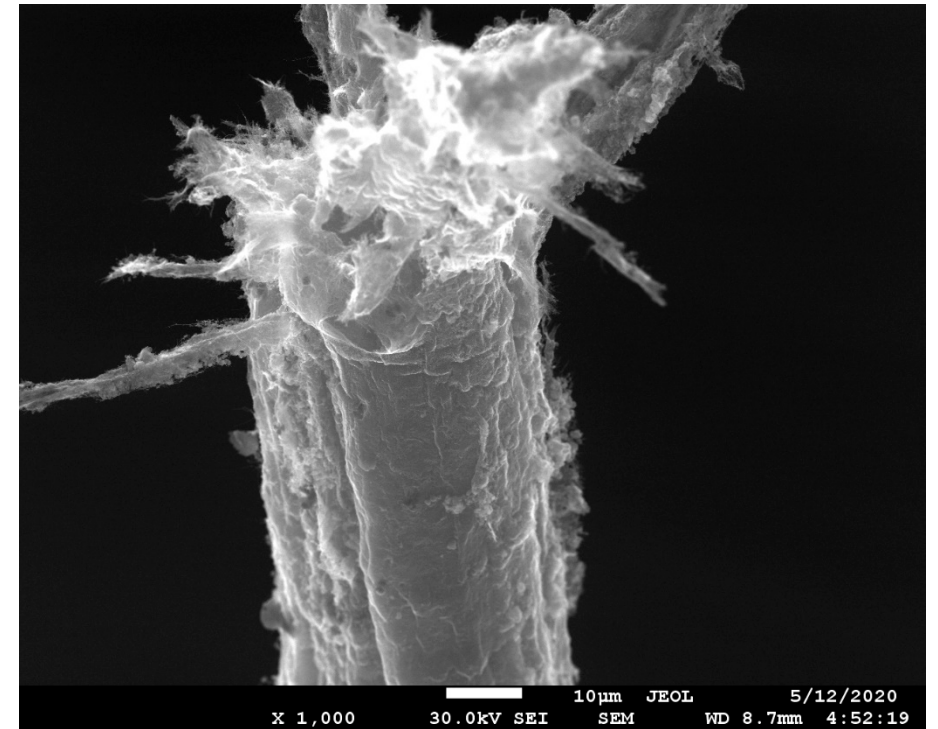


Carbon nanotube thread, \varnothing 30-40 μm

- Before exposition in a vacuum chamber

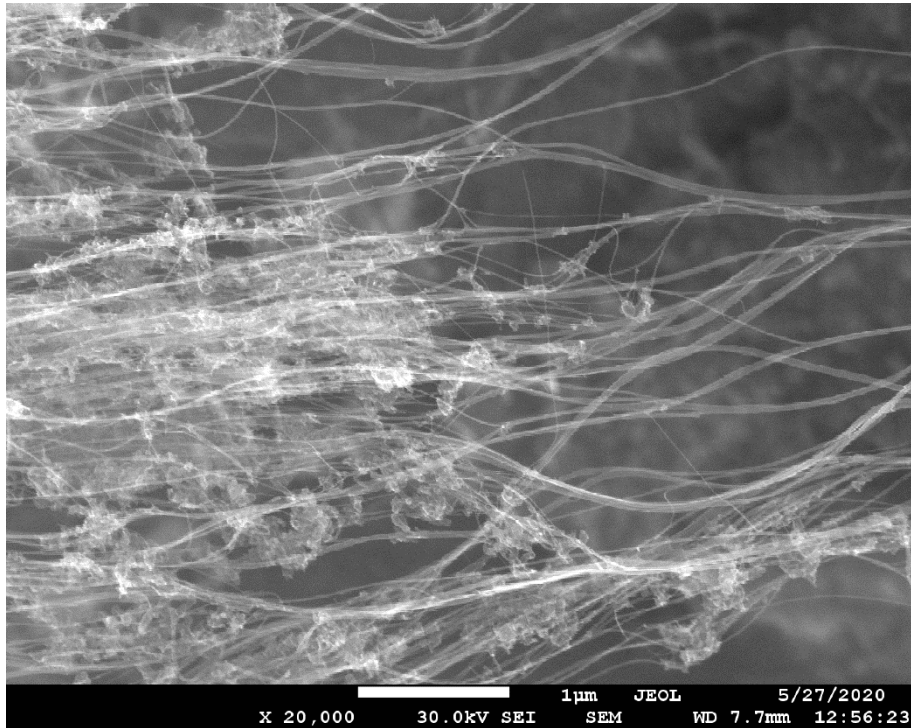


- After exposition in a vacuum chamber

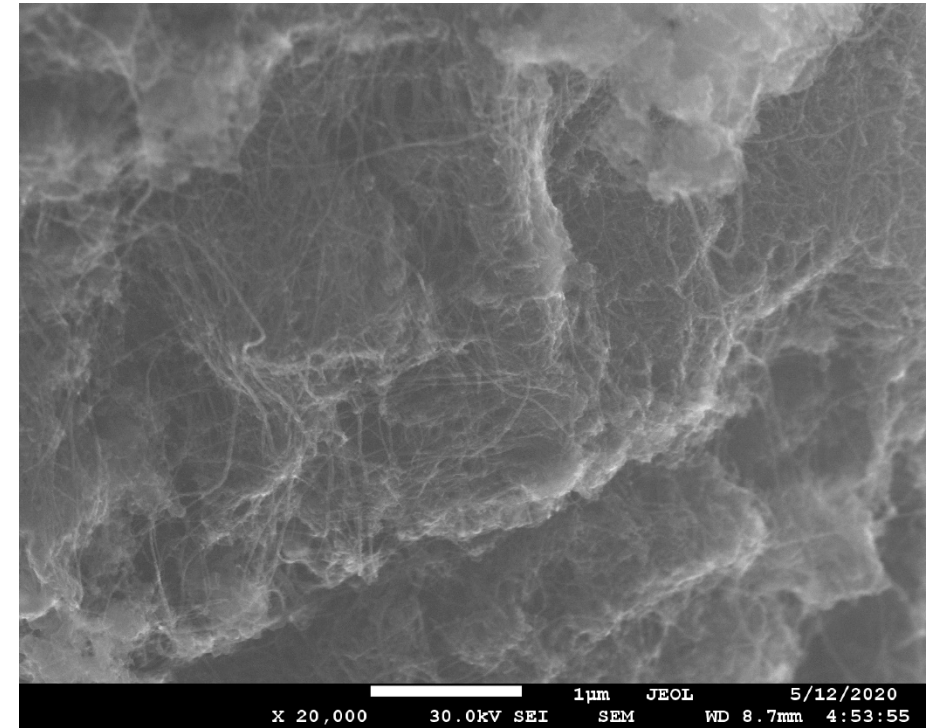


Carbon nanotube thread, \varnothing 30-40 μm

- Before exposition in a vacuum chamber



- After exposition in a vacuum chamber



Carbon nanotube thread, \varnothing 300-400 μm

- Before exposition in a vacuum chamber

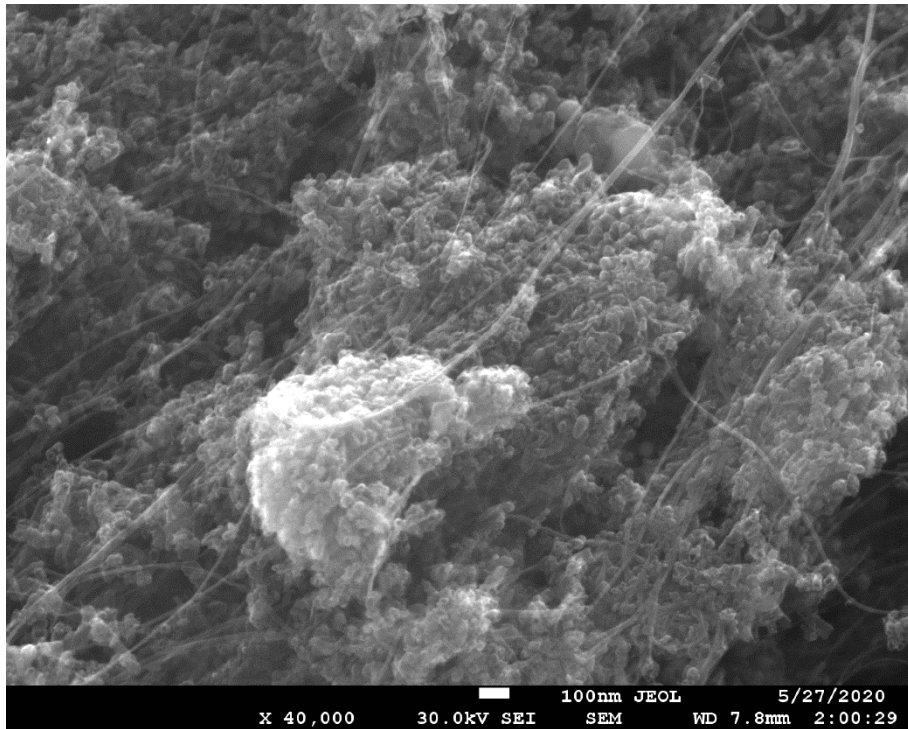


- After exposition in a vacuum chamber

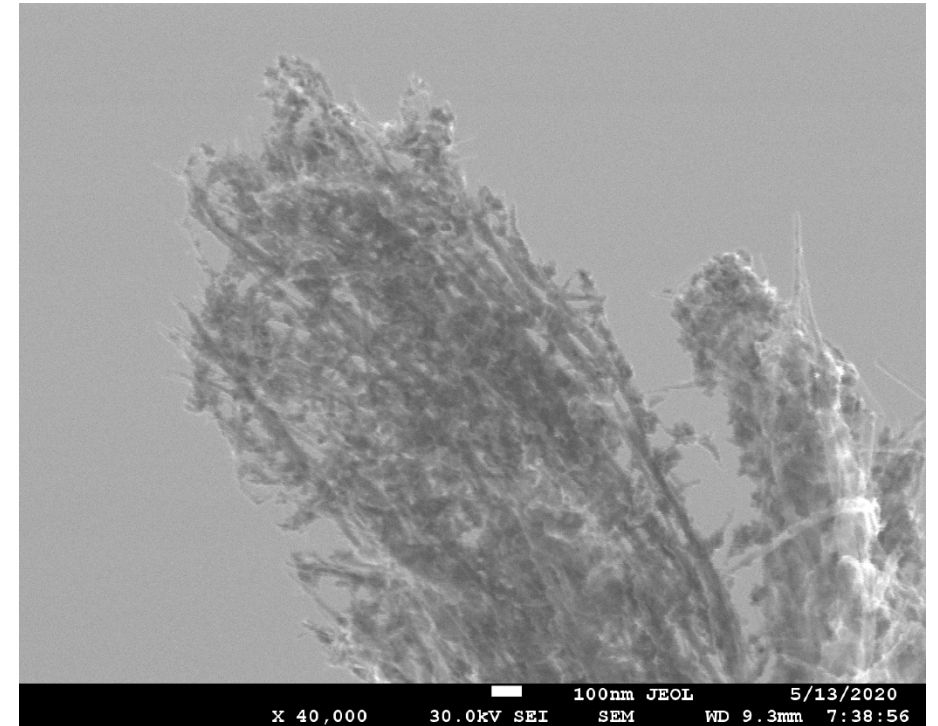


Carbon nanotube thread, \varnothing 30-40 μm

- Before exposition in a vacuum chamber

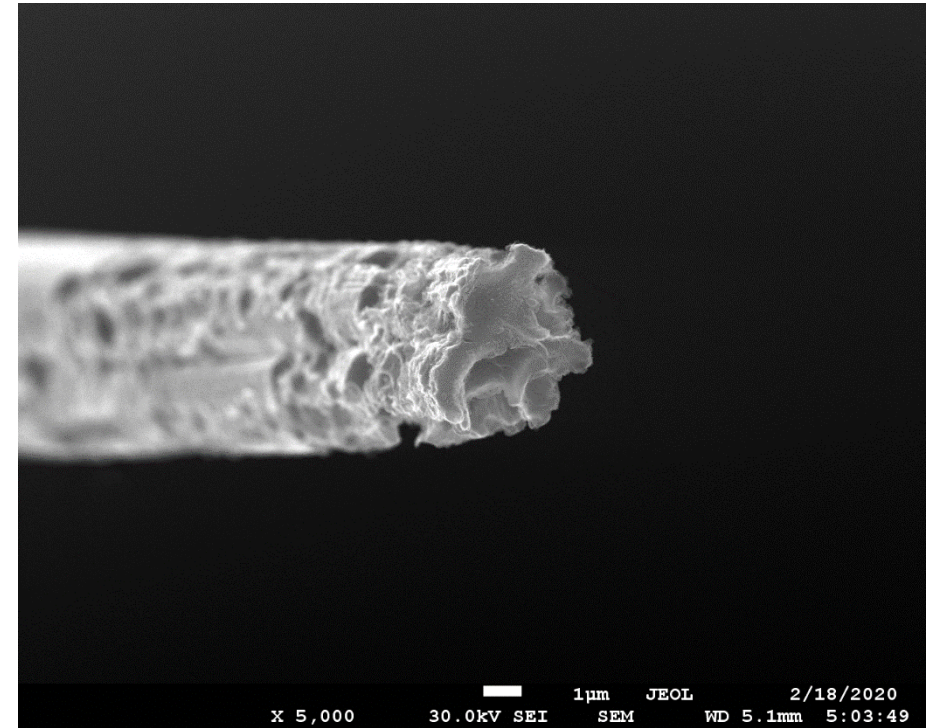
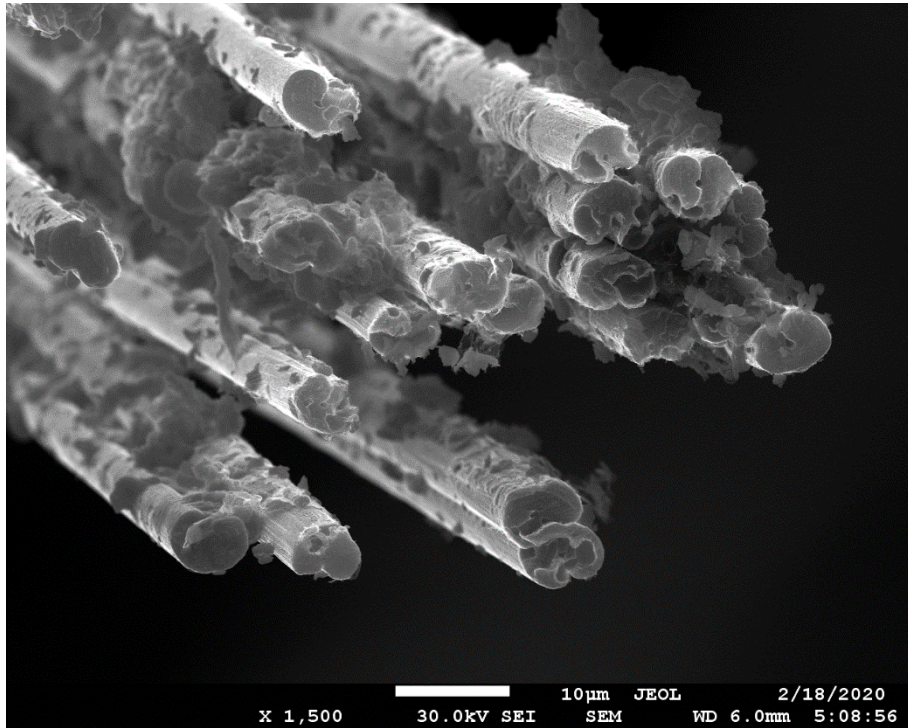


- After exposition in a vacuum chamber

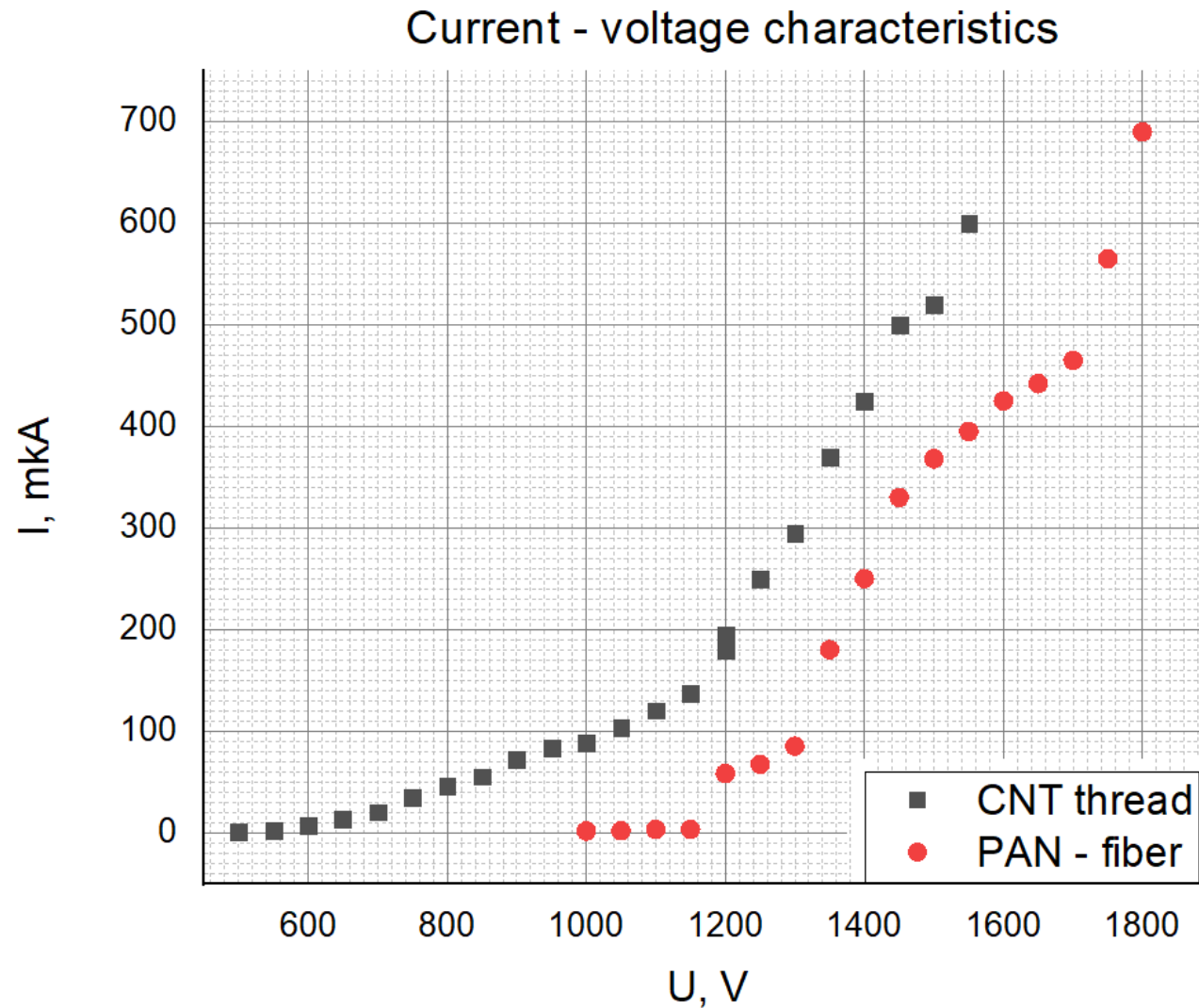


PAN – fiber cathode

- After exposition in a vacuum chamber



CVC of the materials studied



Conclusion

Conducted research showed, that PAN-fiber cathodes are more durable than CNT thread cathodes. PAN-fiber cathodes, being exposed for the same amount of time as the CNT thread ones, were less. The shape of CNT thread cathodes changed significantly. On the other hand CNT thread cathodes provide with more emission current than PAN-fiber cathodes, when the same voltage is applied.

Both materials are feasible in production of field emission appliances.