FIELD EMISSION PROPERTIES OF CARBON NANOTUBE THREADS

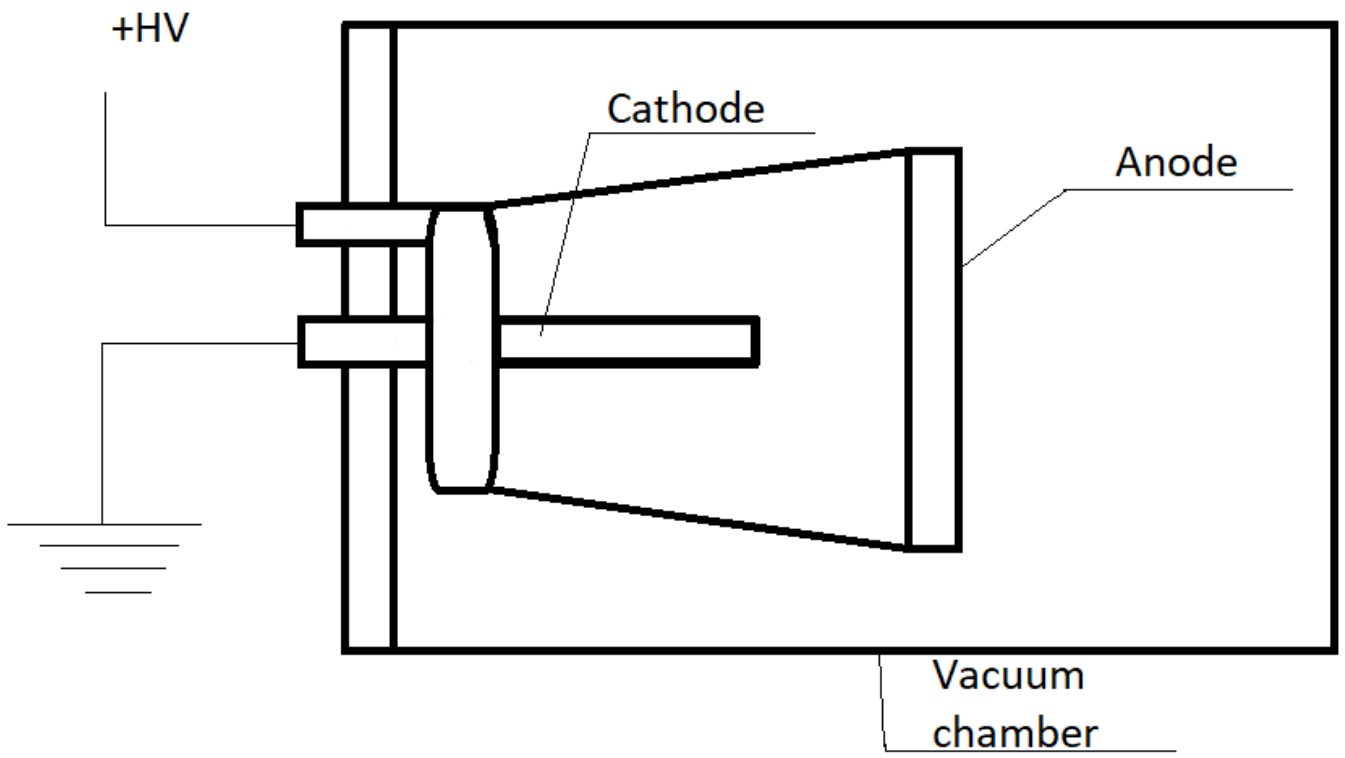
POLYACRYLONITRILE FIBERS

Kosarev I.N., Masnaviev B.I., Karaeva A.R., Mitberg E.B., Mordkovich V.Z., Sheshin E.P

Aim of the research

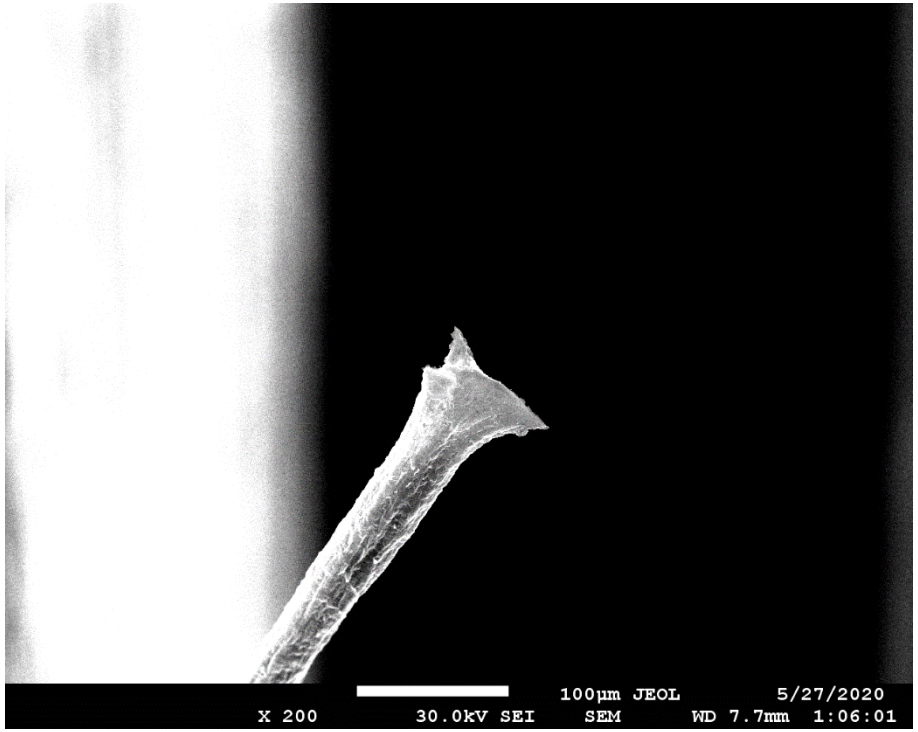
- Test different kinds of carbon materials and determine which one is the best for use as a cathode in a field emission lamp.

Scheme of the test stand



Carbon nanotube thread, Ø 20-30 mkm

- Before exposition in a vacuum chamber



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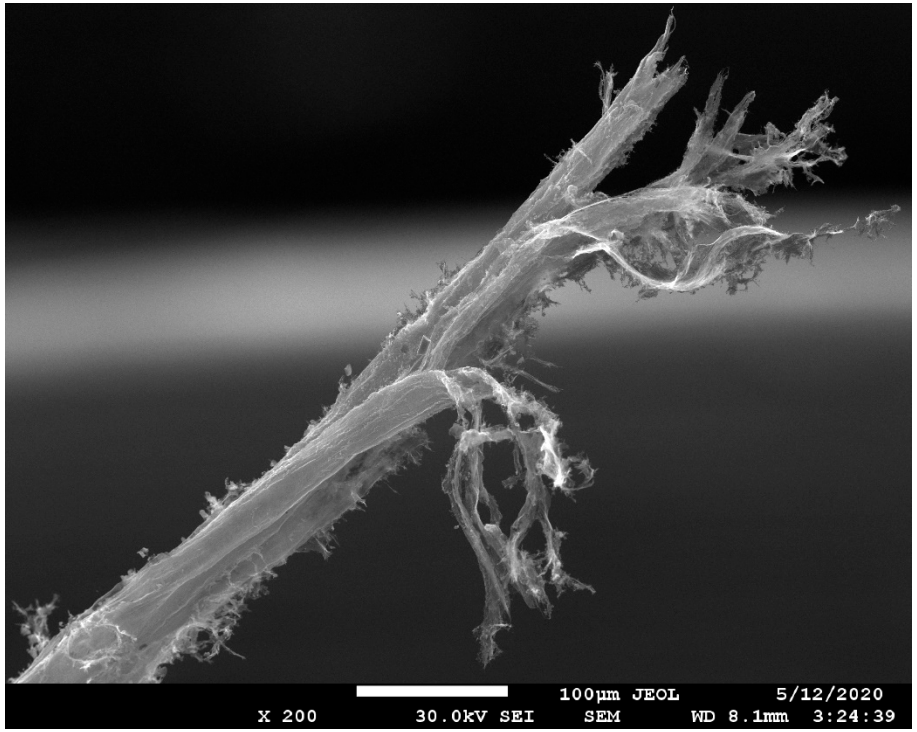

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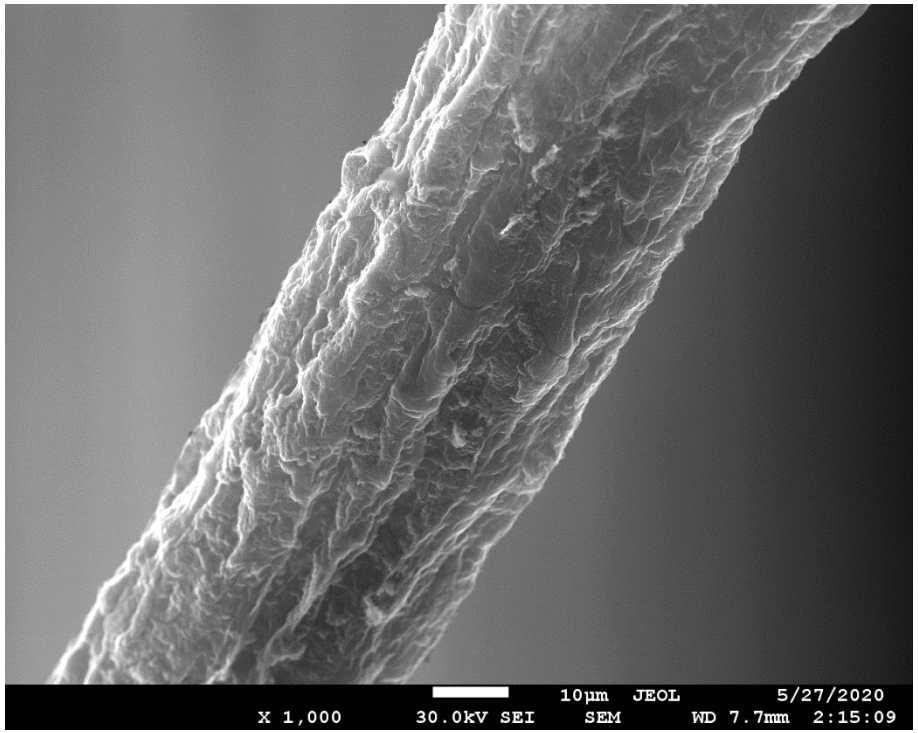

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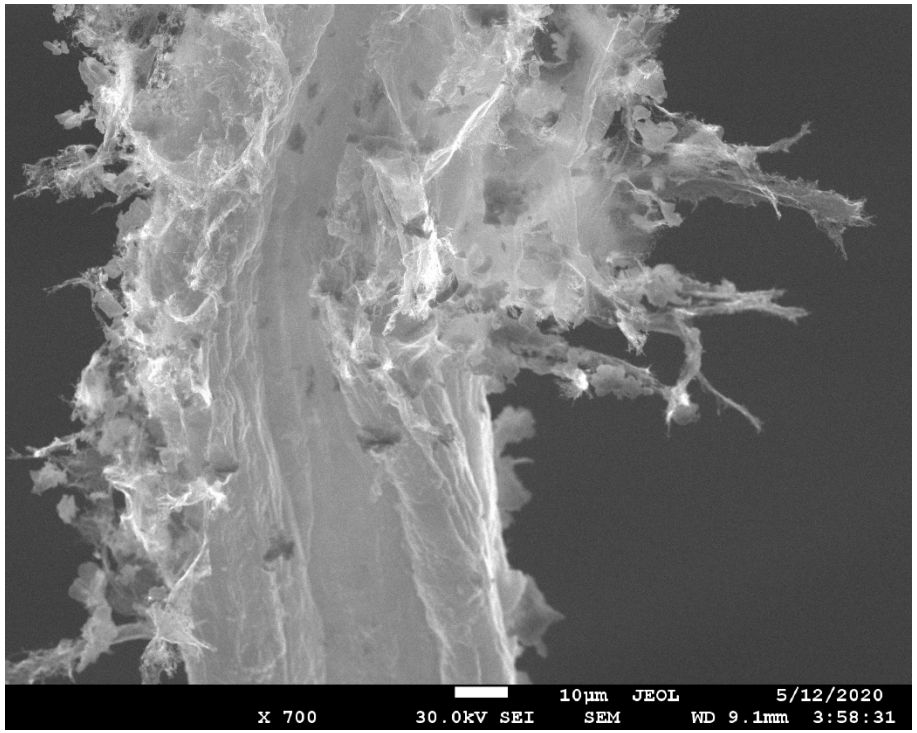

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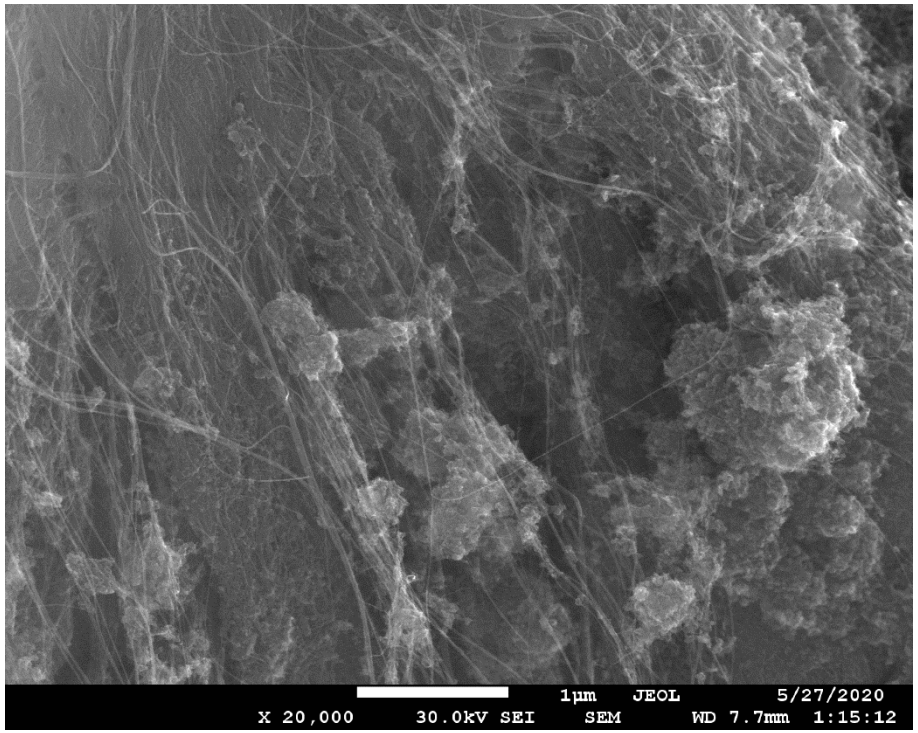
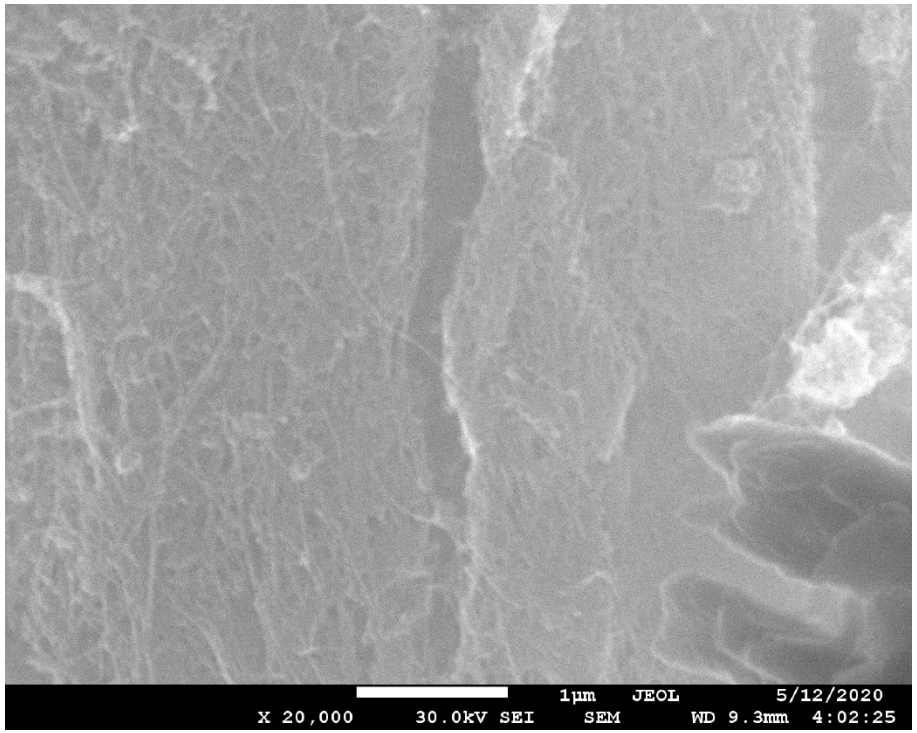
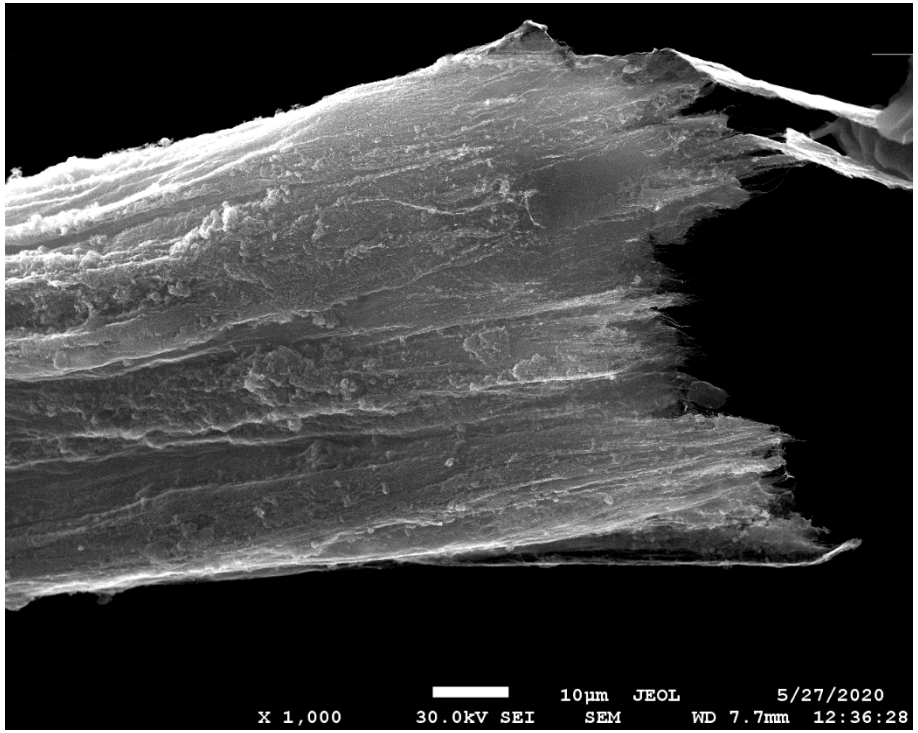


- After exposition in a vacuum chamber

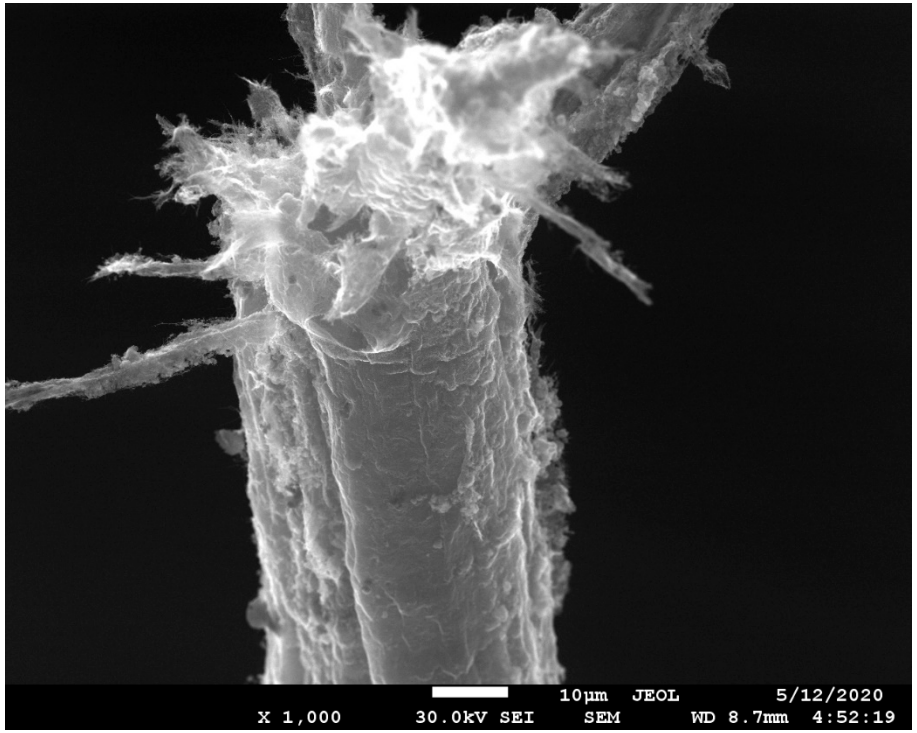


Carbon nanotube thread, Ø 30-40 mkm

- Before exposition in a vacuum chamber



- After exposition in a vacuum chamber



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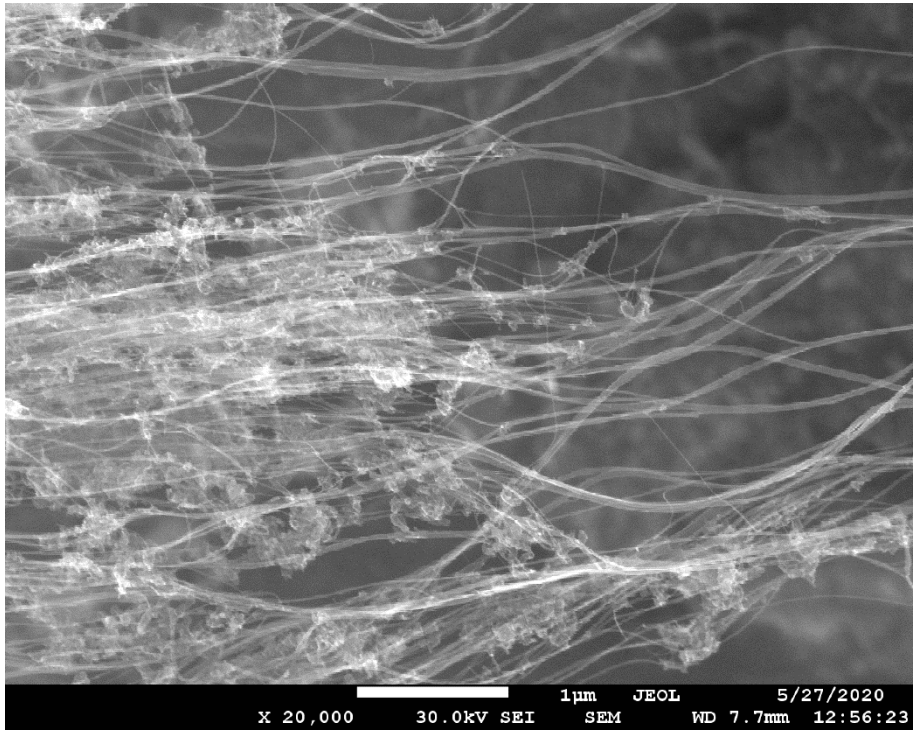
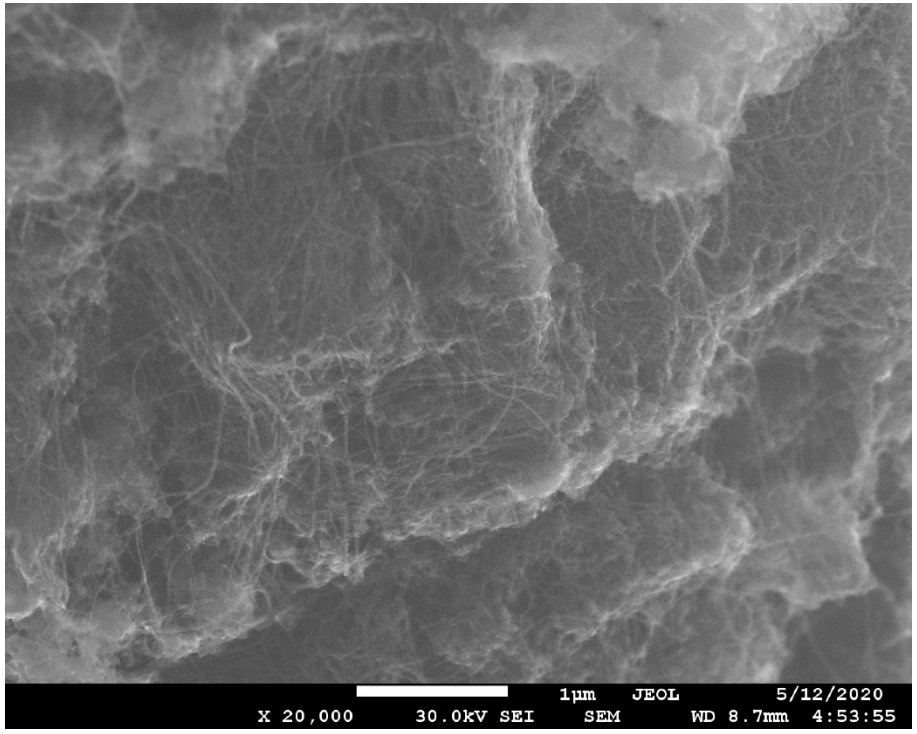


- After exposition in a vacuum chamber



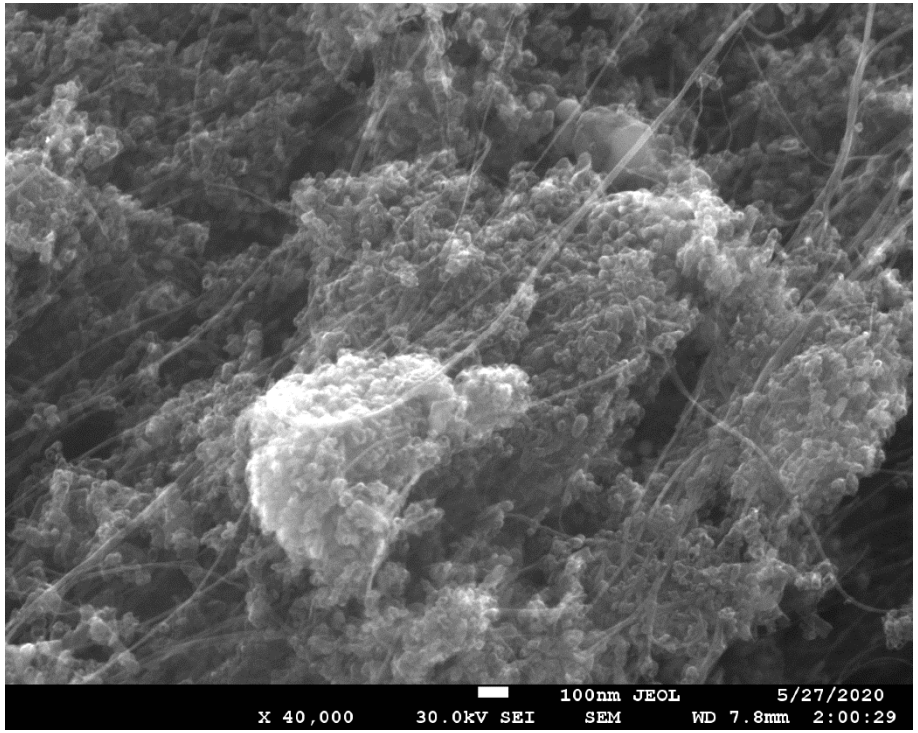
Carbon nanotube thread, Ø 300-400 mkm

- Before exposition in a vacuum chamber

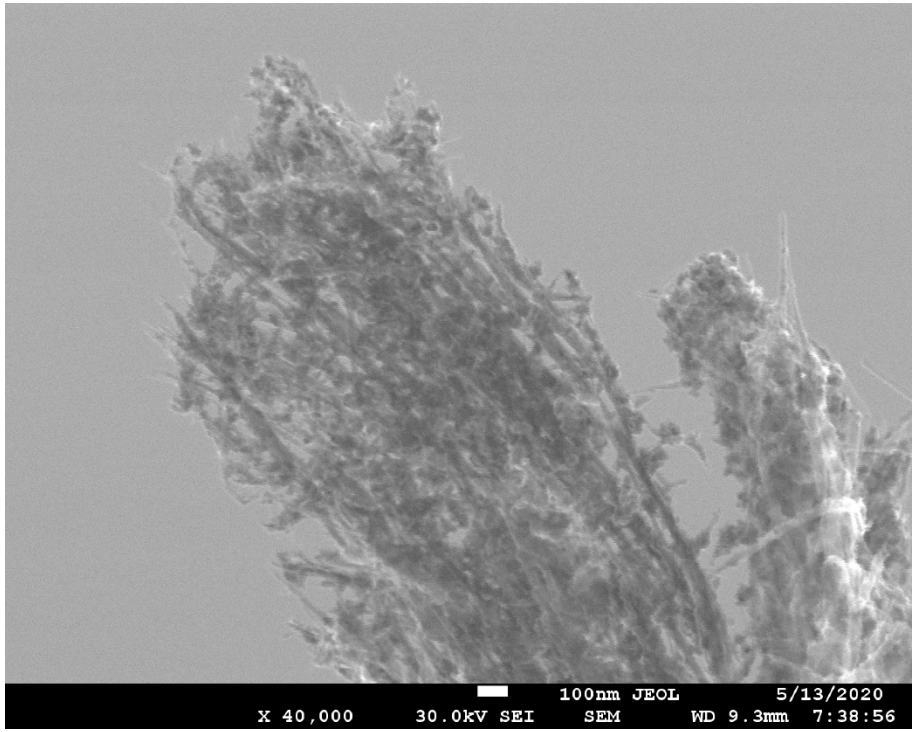
- After exposition in a vacuum chamber

Carbon nanotube thread, Ø 30-40 mkm

- Before exposition in a vacuum chamber

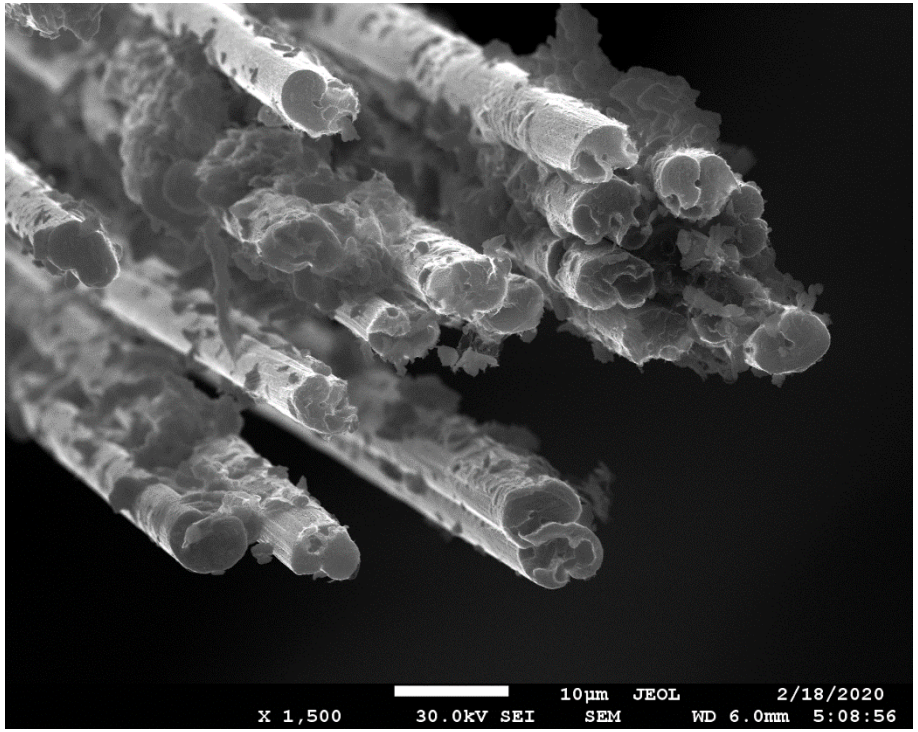


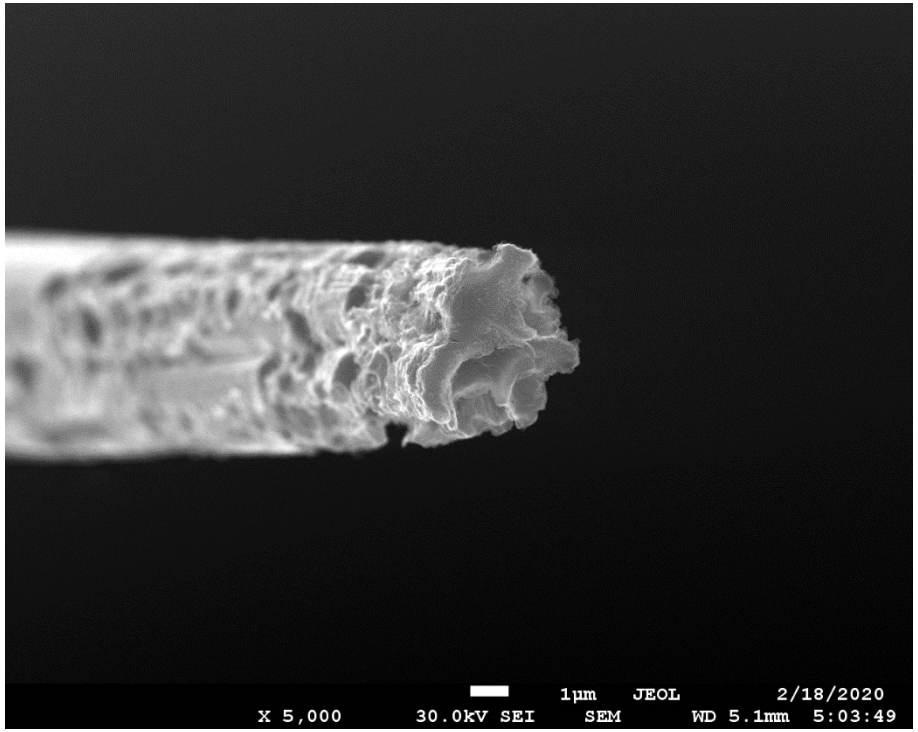
- After exposition in a vacuum chamber



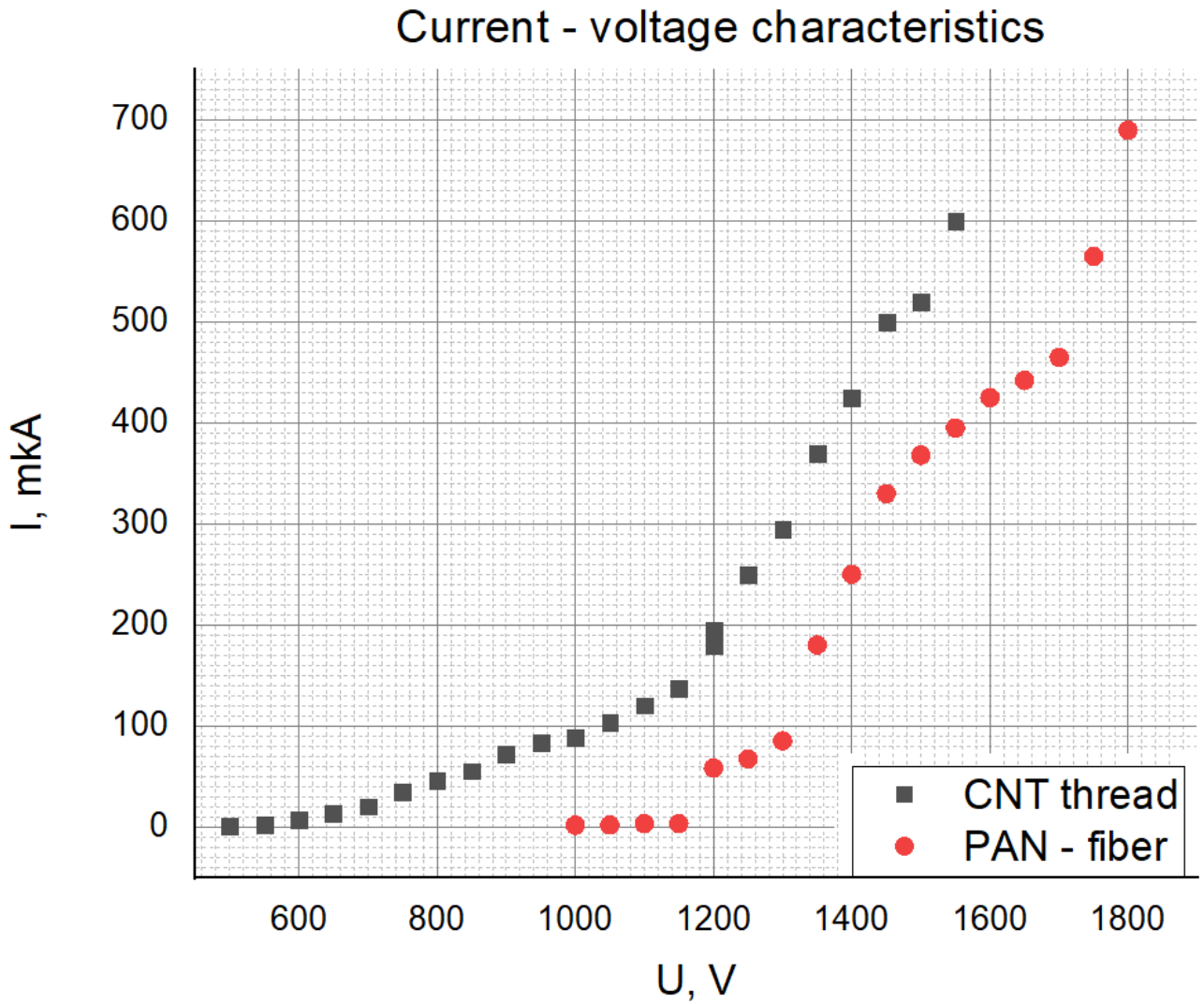
PAN – fiber cathode

- 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.