

DOI: <https://doi.org/10.15407/techned2016.04.095>

## INFLUENCE OF ELECTRICAL PARAMETERS OF HIGH-VOLTAGE ELECTRIC-DISCHARGE SYSTEMS FOR SYNTHESIS OF NANOCARBON ON THEIR PERFORMANCE AND SPECIFIC POWER INPUTS

Journal	Tekhnichna elektrodynamika
Publisher	Institute of Electrodynamics National Academy of Science of Ukraine
ISSN	1607-7970 (print), 2218-1903 (online)
Issue	Nº 4, 2016 (July/August)
Pages	95 – 97

### Author

**D.V. Vinnychenko**

Institute of Pulse Processes and Technologies National Academy of Sciences of Ukraine,  
pr. Zhovtnevyi, 43-a, Mykolayiv, 54018, Ukraine,  
e-mail: vdvvvs@inbox.ru

### Abstract

*The influence of electrical parameters of high-voltage electric-discharge systems (EDS) for synthesis of nanocarbon on their performance and specific power inputs was experimentally studied. The regularities of influence of electrical and technological characteristics of EDS on synthesis efficiency of nanocarbon materials (NCM) in gaseous carbonic mediums at limited power inputs are determined. References 12, figures 2.*

**Key words:** electric-discharge, current, pulse, high voltage, power, nanocarbon synthesis, productivity.

Received: 03.02.2016

Accepted: 07.04.2016

Published: 21.06.2016

## References

1. Bohuslavskyy L.Z., Vinnychenko D.V., Nazarova N.S. High voltage installation for the synthesis of nanocarbon with onion-like structure with the control system of electrical characteristics of gas discharge. *Visnyk NTU KhPI*. 2015. No 20 (1129). Pp. 11–23. (Ukr)
2. Vinnychenko D.V. Determination of the optimal characteristics of high voltage electric-discharge system for implementing electro-pulse synthesis technology of nanocarbon. *Tekhnichna Elektrodynamika*. 2014. No 4. P. 129–131. (Ukr)
3. Vinnychenko D.V., Nazarova N.S. Development of principles of management regime parameters of electrical systems for the electric-discharge synthesis of carbon nanomaterials. *Visnyk NTU KhPI*. 2015. No 12(1121). P. 292–297. (Ukr)
4. Vovchenko A.I., Tertilov R.V. Synthesis of capacitive nonlinear-parametrical energy sources for discharge-pulse technologies. *Zbirnyk Naukovykh Prats Natsionalnoho Universytetu Korablenbudivannia*. 2010. No 4. P. 118–124. (Rus)
5. Zolotarenko An.D., Zolotarenko Al.D., Shchur D.V., Zahynaichenko S.Ju., Dubovoj A.H. By the processes of carbon nanostructures formation in the liquid phase. *Trudy konferentsii ICHMS'2009*. 2009. P. 404–405. (Rus)
6. Kuskova N.Yu., Petrychenko S.V., Tsolyn P.L., Baklar V.Yu. Dependence of carbon nanomaterials on the molecular structure of organic liquids in the process of discharge machining. *Elektronnaia Obrabotka Materialov*

- . 2013. Vol. 49. No 1. P. 14–19. (Rus)
7. Suprunovska N.I., Shcherba A.A. Processes of energy redistribution between parallel connected capacitors. *Tekhnichna Elektrodynamika*. 2015. No 4. P. 3–11. (Rus)
8. Shcherba A.A., Suprunovska N.I., Synytsyn V.K., Ivashchenko D.C. Aperiodic and oscillatory processes of capacitor discharge at forced limitation of duration. *Tekhnichna Elektrodynamika*. 2012. No 3. P. 9–10. (Rus)
9. Berkowitz A.E., Walter J.L. Sparc erosion: A method for producing rapidly quenched fine powder. *J. of Mater. Res.* March/April, 1987. No 2 (2). P. 277–288.
10. Ivanova O.M., Danylenko M.I., Monastyrskyy G.E., Kolomytsev V.I., Koval Y.M., Shcherba A.A., Zaharchenko S.M., Portier R. Investigation of the formation mechanisms for Ti-Ni-Zr-Cu nanopowders fabricated by electrospark Erosion method in cryogenic liquids. *Metallofizika i Noveishie Tekhnologii*
- . 2009. Vol. 31. No 5. P. 603–614.
11. Shcherba A.A., Kosenkov V.M., Bychkov V.M. Mathematical closed model of electric and magnetic fields in the discharge chamber of an Electrohydraulic installation. *Surface engineering and applied electrochemistry*
- . 2015. Vol. 51. No 6. P. 581–588.
12. Shcherba A.A., Suprunovska N.I. Study features of transients in the circuits of semiconductor discharge pulses generators with nonlinear electro-Spark load. IEEE International Conference on *Intelligent Energy and Power Systems*, IEPS 2014. Conference Proceedings. 2014. P. 50–54.

[PDF](#)