

Correction

## Correction: Aljure, M.; Becerra, M.; Karlsson, E.M. Streamer Inception from Ultra-Sharp Needles in Mineral Oil Based Nanofluids *Energies* 2018, 11, 2064

Mauricio Aljure <sup>1,\*</sup> , Marley Becerra <sup>1</sup> and Mattias E. Karlsson <sup>2</sup>

<sup>1</sup> School of Electrical Engineering and Computer Science, KTH Royal Institute of Technology, SE-100 44 Stockholm, Sweden; marley@kth.se

<sup>2</sup> School of Engineering Sciences in Chemistry, Biotechnology and Health, KTH Royal Institute of Technology, SE-100 44 Stockholm, Sweden; mekarls@kth.se

\* Correspondence: maraljure@gmail.com or mauar@kth.se

Received: 5 September 2018; Accepted: 10 October 2018; Published: 25 October 2018



The authors wish to make the following corrections to their paper [1]:

i. On pages 13 and 14, the numbering of references from 17 to 30 is incorrect. References 17 to 30 should be renumbered from the original order below:

17. Liu, Z.; Liu, Q.; Wang, Z.D.; Jarman, P.; Krause, C.; Smith, P.W.R.; Gyore, A. Partial discharge behaviour of transformer liquids and the influence of moisture content. In Proceedings of the 2014 IEEE 18th International Conference on Dielectric Liquids (ICDL), Bled, Slovenia, 29 June–3 July 2014.
18. Yamashita, H.; Yamazawa, K.; Wang, Y.S. The effect of tip curvature on the prebreakdown streamer structure in cyclohexane. *IEEE Trans. Dielectr. Electr. Insul.* **1998**, *5*, 396–401.
19. Dumitrescu, L.; Lesaint, O.; Bonifaci, N.; Denat, A.; Notingher, P. Study of streamer inception in cyclohexane with a sensitive charge measurement technique under impulse voltage. *J. Electrostat.* **2001**, *53*, 135–146.
20. Pourrahimi, A.M.; Hoang, T.A.; Liu, D.; Pallon, L.K.H.; Gubanski, S.; Olsson, R.T.; Gedde, U.W.; Hedenqvist, M.S. Highly efficient interfaces in nanocomposites based on polyethylene and ZnO nano/hierarchical particles: A novel approach toward ultralow electrical conductivity insulations. *Adv. Mater.* **2016**, *28*, 8651–8657.
21. Li, J.; Du, B.; Wang, F.; Yao, W.; Yao, S. The effect of nanoparticle surfactant polarization on trapping depth of vegetable insulating oil-based nanofluids. *Phys. Lett. A* **2016**, *380*, 604–608.
22. Aljure, M.; Becerra, M.; Pallon, L.K.H. Electrical conduction currents of a mineral oil-based nanofluid in needle-plane configuration. In Proceedings of the 2016 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP), Toronto, ON, Canada, 16–19 October 2016; pp. 687–690.
23. Primo, V.A.; Garcia, B.; Albarracin, R. Improvement of transformer liquid insulation using nanodielectric fluids: A review. *IEEE Electr. Insul. Mag.* **2018**, *34*, 13–26.
24. Jin, H.; Andritsch, T.; Morshuis, P.H.F.; Smit, J.J. AC breakdown voltage and viscosity of mineral oil based SiO<sub>2</sub> nanofluids. In Proceedings of the 2012 Annual Report Conference on Electrical Insulation and Dielectric Phenomena, Montreal, QC, Canada, 14–17 October 2012; pp. 902–905.
25. Jin, H.; Morshuis, P.; Mor, A.R.; Smit, J.J.; Andritsch, T. Partial discharge behavior of mineral oil based nanofluids. *IEEE Trans. Dielectr. Electr. Insul.* **2015**, *22*, 2747–2753.
26. Du, Y.; Lv, Y.; Li, C.; Chen, M.; Zhong, Y.; Zhou, J.; Li, X.; Zhou, Y. Effect of semiconductive nanoparticles on insulating performances of transformer oil. *IEEE Trans. Dielectr. Electr. Insul.* **2012**, *19*, 770–776.

27. Dung, N.V.; Høidalen, H.K.; Linhjell, D.; Lundgaard, L.E.; Unge, M. Effects of reduced pressure and additives on streamers in white oil in long point-plane gap. *J. Phys. D Appl. Phys.* **2013**, *46*, 255501.
28. McCool, J.I. *Using the Weibull Distribution*; John Wiley & Sons, Inc.: Hoboken, NJ, USA, 2012.
29. Lesaint, O.L.; Top, T.V. Streamer initiation in mineral oil. part I: Electrode surface effect under impulse voltage. *IEEE Trans. Dielectr. Electr. Insul.* **2002**, *9*, 84–91.
30. Becerra, M.; Frid, H.; Vázquez, P.A. Self-consistent modeling of laminar electrohydrodynamic plumes from ultra-sharp needles in cyclohexane. *Phys. Fluids* **2017**, *29*, 123605.

to the following, corrected numbering:

17. Dumitrescu, L.; Lesaint, O.; Bonifaci, N.; Denat, A.; Notingher, P. Study of streamer inception in cyclohexane with a sensitive charge measurement technique under impulse voltage. *J. Electrostat.* **2001**, *53*, 135–146.
18. Liu, Z.; Liu, Q.; Wang, Z.D.; Jarman, P.; Krause, C.; Smith, P.W.R.; Gyore, A. Partial discharge behaviour of transformer liquids and the influence of moisture content. In Proceedings of the 2014 IEEE 18th International Conference on Dielectric Liquids (ICDL), Bled, Slovenia, 29 June–3 July 2014.
19. Yamashita, H.; Yamazawa, K.; Wang, Y.S. The effect of tip curvature on the prebreakdown streamer structure in cyclohexane. *IEEE Trans. Dielectr. Electr. Insul.* **1998**, *5*, 396–401.
20. Becerra, M.; Frid, H.; Vázquez, P.A. Self-consistent modeling of laminar electrohydrodynamic plumes from ultra-sharp needles in cyclohexane. *Phys. Fluids* **2017**, *29*, 123605.
21. Pourrahimi, A.M.; Hoang, T.A.; Liu, D.; Pallon, L.K.H.; Gubanski, S.; Olsson, R.T.; Gedde, U.W.; Hedenqvist, M.S. Highly efficient interfaces in nanocomposites based on polyethylene and ZnO nano/hierarchical particles: A novel approach toward ultralow electrical conductivity insulations. *Adv. Mater.* **2016**, *28*, 8651–8657.
22. Li, J.; Du, B.; Wang, F.; Yao, W.; Yao, S. The effect of nanoparticle surfactant polarization on trapping depth of vegetable insulating oil-based nanofluids. *Phys. Lett. A* **2016**, *380*, 604–608.
23. Aljure, M.; Becerra, M.; Pallon, L.K.H. Electrical conduction currents of a mineral oil-based nanofluid in needle-plane configuration. In Proceedings of the 2016 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP), Toronto, ON, Canada, 16–19 October 2016; pp. 687–690.
24. Primo, V.A.; Garcia, B.; Albarracin, R. Improvement of transformer liquid insulation using nanodielectric fluids: A review. *IEEE Electr. Insul. Mag.* **2018**, *34*, 13–26.
25. Jin, H.; Andritsch, T.; Morshuis, P.H.F.; Smit, J.J. AC breakdown voltage and viscosity of mineral oil based SiO<sub>2</sub> nanofluids. In Proceedings of the 2012 Annual Report Conference on Electrical Insulation and Dielectric Phenomena, Montreal, QC, Canada, 14–17 October 2012; pp. 902–905.
26. Jin, H.; Morshuis, P.; Mor, A.R.; Smit, J.J.; Andritsch, T. Partial discharge behavior of mineral oil based nanofluids. *IEEE Trans. Dielectr. Electr. Insul.* **2015**, *22*, 2747–2753.
27. Du, Y.; Lv, Y.; Li, C.; Chen, M.; Zhong, Y.; Zhou, J.; Li, X.; Zhou, Y. Effect of semiconductive nanoparticles on insulating performances of transformer oil. *IEEE Trans. Dielectr. Electr. Insul.* **2012**, *19*, 770–776.
28. Dung, N.V.; Høidalen, H.K.; Linhjell, D.; Lundgaard, L.E.; Unge, M. Effects of reduced pressure and additives on streamers in white oil in long point-plane gap. *J. Phys. D Appl. Phys.* **2013**, *46*, 255501.
29. McCool, J.I. *Using the Weibull Distribution*; John Wiley & Sons, Inc.: Hoboken, NJ, USA, 2012.
30. Lesaint, O.L.; Top, T.V. Streamer initiation in mineral oil. part I: Electrode surface effect under impulse voltage. *IEEE Trans. Dielectr. Electr. Insul.* **2002**, *9*, 84–91.

ii. On the last paragraph of page 9, the last sentence should be changed from:

However, the results in [11] also show the consistent increase in the initiation voltage of prebreakdown phenomena in both polarities, as reported in Figure 11.

to the following, corrected version:

However, the results in [26] also show the consistent increase in the initiation voltage of prebreakdown phenomena in both polarities, as reported in Figure 11.

iii. On the last paragraph of page 10, the third sentence should be changed from:

Even though the existing hypotheses of the dielectric effect of NPs [8–10] were proposed for blunter electrodes (where charge generation before streamer initiation is less important [30]), they should still apply under the experimental conditions here reported.

to the following, corrected version:

Even though the existing hypotheses of the dielectric effect of NPs [5,6,16] were proposed for blunter electrodes (where charge generation before streamer initiation is less important [30]), they should still apply under the experimental conditions here reported.

The authors would like to apologize for any inconvenience caused to the readers by these changes. The changes do not affect the scientific results. The manuscript will be updated and the original will remain online on the article webpage, with a reference to this Correction.

## Reference

1. Aljure, M.; Becerra, M.; Karlsson, E.M. Streamer inception from ultra-sharp needles in mineral oil based nanofluids. *Energies* **2018**, *11*, 2064. [[CrossRef](#)]



© 2018 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).