10th October 2014

Dear editor,

the presented work explains how an atmospheric pressure microwave plasma torch can be ignited without any additional igniters and provides continuous and stable plasma operation. Atmospheric pressure plasma sources come more and more important for industrial processes since they offer a variety of different applications. The presented microwave plasma torch offers the opportunity of electrodeless plasma, an ignition of the plasma solely by the supplied microwave as well as a stable and continuous plasma operation. To achieve the ignition of the plasma without any additional igniters as well as the stable and continuous plasma operation the used power supply and the plasma torch have to characterized in detail and carefully adjusted to each other. This process can be described in a common publication but it is much more clear and descriptive if all the needed procedures to characterize the plasma torch and the power supply and how they are adjusted carefully to each other are presented in a movie and therefore are published as a video article in JoVE. Furthermore, the ignition of the plasma is a very fast process and can only be observed with a high speed camera. Thus the publication by JoVE offers the opportunity to also illuminate this aspect and show the slow motion picture of the plasma ignition.

The main part of the presented work was conducted by Martina Leins and was supervised by Uwe Schumacher. Sandra Gaiser assisted with the high speed camera recording. Andreas Schulz and Matthias Walker supported the work with many helpful advices and fruitful discussions. Thomas Hirth is head of the institute and therefore is involved in the presented work.

The preparation of the manuscript was assisted by Mathew Solomon.

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Lastly, I would like to thank the editors for considering my work for publication in JoVE.

Thank you in advance and kind regards

Martina Leins