

عنوان مقاله:

Investigation of the Effect of Insulator Sleeves on the Ion Emission in a ۴kJ Plasma Focus Device

محل انتشار:

فصلنامه فیزیک و مهندسی پرتو، دوره 2، شماره 3 (سال: 1400)

تعداد صفحات اصل مقاله: 7

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خلاصه مقاله:

For configuring plasma focus device (PFD), the gap between electrodes is filled out with a gas at low pressure. When discharge is starting at the surface of the insulator, the gas breaks down, leading to the flow of the plasma current sheath toward the anode end. A homogeneous and symmetric current sheath which is essential for ion emission and a proper plasma pinching can be obtained when there is an electrical breakdown along the insulator. Therefore, one of the most important parts of the plasma focus is the insulator. In the present research, the effect of different insulator sleeves on the intensity of ions emitted from a ۴ kJ PFD filled with Neon has been studied. Pyrex and Quartz are considered for the insulator materials and the length is varied from ۳ to ۶ cm for Pyrex and from ۳.۵ to ۵.۵ for Quartz. Numerous gas pressures were experimented with voltages of ۱۱, ۱۲ and ۱۳ kV. The results show that both the length and the material of the insulator sleeve can affect the intensity of ions emitted from the device. The length of ۴.۵ cm seems optimal to yield maximum ion emission for Pyrex insulator. For the Quartz insulator, on the other hand, length of ۳.۵ cm results in higher ion emission. In addition, in some cases, utilizing Quartz insulator causes more ion emission compared to the Pyrex insulator.

کلمات کلیدی:

Plasma Focus Device, Insulator Sleeve, Ion Emission, Neon Gas

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<https://civilica.com/doc/1305038>

