

## **Electromagnetic separator of plasma**

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The progress in the widespread utilization of the PVD methods is determined in many respects by the plasma quality and, therefore, the necessity of an application of plasma separators, in particular magnetic separators [1-4]. One needs to note that traditional magnetic separators have a number of problems their using, namely their unwieldiness, the presence of the isolated cameras and so on. We have proposed, manufactured and investigated the simple separator of plasma that doesn't require using additional cameras. As a source of metallic plasma the standard cathode vaporizer in the installation "BULAT 6" was in use.

Plasma stream from the cathode flowed through the not protected by isolation spiral solenoid. The solenoid input (from the cathode side) was under floating potential. The solenoid output was connected to the autonomous power supply system. The solenoid was prepared with stride winding and 90 degree turn. The solenoid current was 20-90 A and the solenoid voltage with respect to the vessel (earth) was + 15 V. In this case drifting charged particles could freely fly out from the interior solenoid region to its boundary. The glow of the turned flow of plasma was observed during the supplying of the cathode and the solenoid. Plasma flow was separated from the coils and extended along the axis of solenoid.

One can assume that this device ensures radial electric with respect to the bulk of plasma (the diameter of the bulk of plasma is comparable with the cathode diameter), the toroidal magnetic field, produced by solenoid, was of an order of 20 Oe. Magnetic field strength was sufficient for the magnetization of electrons, but it was rather small for magnetizing the ions and charged micro-droplets. The experiments carried out with aluminum cathode on the deposition of coatings at the stainless steel substrate have shown the high effectiveness of this separator operation. Coatings without droplets were obtained also on the glass substrate with HF- displacement.

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