

Technology Opportunity, Ref. No. UZ-07/027

Novel focusable ion beam source with a non-eroding solid tip

A source for focused ion beams has been invented that is easily operated and has improved properties regarding source size, achievable brightness and anticipated monochromaticity.

Keyword solid electrolyte, ion beam, silver ion beam, focused ion beam, ion gun

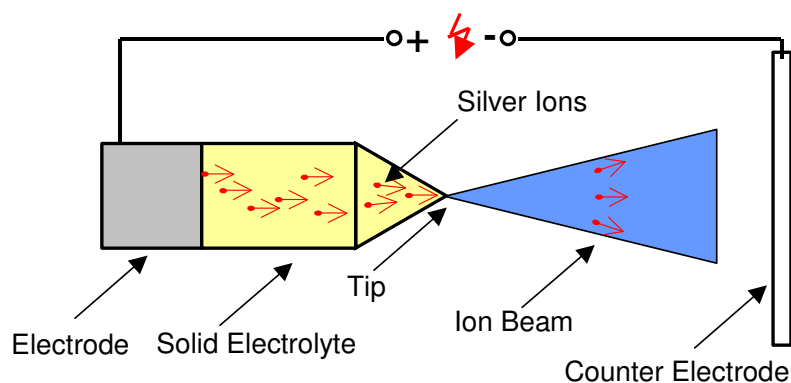
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Reference Publication in preparation

Background Focused ion beams (FIB) emitted into vacuum or a gas are widely used in industry and research for the characterization and processing of surfaces. The tip of most commercial FIB sources consists of a liquid metal, such as gallium, which however tends to fluctuate during operation. This has a negative influence on the stability of the emission current and the focusing and positioning capabilities. It is also possible to generate a FIB with solid metal tips, but such tips deteriorate rapidly during operation due to erosion of material from the tip apex.

Invention The present invention is based on the novel idea to build a continuously operable ion source by combining a solid electrolyte with a separate reservoir for the ions. The resulting FIB source is solid and still does not erode at its tip during operation. The invention resolves the shortcomings of the above mentioned devices and provides long-term stable operation with regards to achievable brightness and anticipated monochromaticity. Furthermore, it allows for operation at room temperature or slightly above by exploitation of field emission instead of thermionic emission. It also features comparably low cost and compact size and is easily operated.

Applications Any focused ion beam emission (FIB) applications, such as ion implanting,



milling, depositing or etching.

Patent Status Patent filed

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