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Micro-Electrical Discharge Machining (µEDM): Effect of the Electrochemical Etching Parameters on the Fabrication of Cylindrical Tungsten Micro-Tools

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Abstract : The fabrication of cylindrical Tungsten micro-tools with a high aspect ratio is a real challenge because of several constraints that come into during their manufacture. In this paper, we will describe the process used to fabricate these micro-tools. It consists of using electrochemical etching. We will also present the optimal protocol that makes it possible to fabricate micro-tools with a high aspect ratio in a reproducible way. Next, we will show the limit of the experimental parameters chosen to manufacture micro-tools from a wire with an initial diameter of $\Phi_0=250\mu m$. The protocol used allows obtaining an average diameter of $\Phi=88\mu m \pm 1 \mu m$ over a length of $L=3.5mm$.

Keywords : drop-off effect, electrochemical etching, micro-electrical discharge machining, tungsten micro-tools
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