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SEM-EBSD Observation for Microtubes by Using Dieless Drawing Process

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Abstract : Because die drawing requires insertion of a die, a plug, or a mandrel, higher precision and efficiency are demanded for drawing equipment for a tube having smaller diameter. Manufacturing of such tubes is also accompanied by problems such as cracking and fracture. We specifically examine dieless drawing, which is less affected by these drawing-related difficulties. This deformation process is governed by a similar principle to that of reduction in diameter when pulling a heated glass tube. We conducted dieless drawing of SUS304 stainless steel microtubes under various conditions with three factor parameters of heating temperature, area reduction, and drawing speed. We used SEM-EBSD to observe the processing condition effects on microstructural elements. As the result of this study, crystallographic orientation of microtube is clear by using SEM-EBSD analysis.

Keywords : microtube, dieless drawing, IPF (inverse pole figure), GOS (grain orientation spread), crystallographic analysis
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