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Microstructure and texture evolution of Al-7075 alloy processed by equal channel angular pressing
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Abstract
Equal channel angular pressing is an effective technique to control the texture and microstructure of metals and alloys. Texture and microstructure of an Al-7075 alloy subjected to repetitive equal channel angular pressing through a 90° die were evaluated by X-ray diffractometer and orientation imaging microscopy. It is observed that processing through different routes leads to different types of textures, in both qualitative and quantitative senses. The texture calculation by Labotex software reveals that texture strengthens after the first pass and weakens by progressing ECAP process up to 4 passes. Microstructure investigations show that after 4 passes of equal channel angular pressing via routes B<inf>C</inf> and A, very fine grains with average grain size of about 700 nm and 1 μm appear, respectively, and most of the grains evolve into arrays of high angle boundaries. The effects of covering the Al-7075 billets with copper tube on texture and microstructure were also studied.

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