ANALYTICAL AND PHYSICAL MODELS APROACH, IN A DEFORMATION PROCESS

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There are a lot of mathematical models of elastic, elastic-plastic, plastic and elastic-plastic-viscoplastic materials behavior. Although these models are perfect functionally for particular situation, never can applied these „as is" on special process like superplastic deformation. A study of the parametric model versus the phenomenon (physical) model, has to start, by definition, from the law of material behavior, and finish with experimental verification. This paper can be included on this large category of study and try to solve a part of such high complex problem.
The models presented here confirms the theoretical characterization of hypothesis, also explain most of the metalurgical phenomenon. There are no difficult to argued for anyone of this models. The model of dislocation, for example, don't stipulate a limit for stress in order to facilitate the superplastic flow, also the grains rotation occurs the sliding, is'nt evidentiate, as metalurgical mechanism.
The diffusion model suppose that the diffusion occurs into different directions on different sides of the same grain border. This is an imossible physical phenomenon, first of all, because the deformation is'nt symetric. If the grains borders slides just due to the diffusion process, than the network can't rotates, all rotations occurs due to the grains borders migration. The grains elongation could be apparently onto the microstructure, because the stress limit decreases at the same time with the grains growth at contrary with experimental tests, and this stress it's significant less than that measured experimental.

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