

Response to Reviewer 1 Comment

Dear Reviewer:

Thanks for your comment concerning our manuscript entitled “Evolution of grain structure and dynamic precipitation during hot deformation in a medium strength Al-Zn-Mg-Er-Zr aluminum alloy” (materials-2415442). Your comment is all valuable and very helpful for revising and improving our paper, as well as the important guiding significance to our researches.

Er-Zr microalloying has gradually become an effective way to improve the comprehensive performance of aluminum alloys. But the hot deformation behavior of the heat-treatable Al-Zn-Mg-Er-Zr alloys has not been sufficiently studied. And the existence forms of different second phases under different hot deformation parameters and their effects on the hot deformation behavior of the alloys is scarcely studied. $\text{Al}_3(\text{Er, Zr})$ particles in Al-Er-Zr alloy and η phase in Al-Zn-Mg alloy precipitated during hot deformation, which will affect the grain and subgrain microstructures of the alloy, have been reported. However, due to the dynamic precipitation of η phase and $\text{Al}_3(\text{Er, Zr})$ particles in Al-Zn-Mg-Er-Zr alloy, the interaction between η phase and $\text{Al}_3(\text{Er, Zr})$ particles and their joint influence on the hot deformation behavior will be more complicated.

So in this paper, the hot deformation behavior of Al-Zn-Mg-Er-Zr alloy at strain rates ranging from 0.01s^{-1} to 10s^{-1} and temperatures ranging from 350 to 500°C has been studied by isothermal compression experiments. The hot deformation constitutive model was established and the steady-state plastic working window was obtained by processing maps. The precipitation of η phase and $\text{Al}_3(\text{Er, Zr})$ phase and its effect on the grain and subgrain microstructure of Al-Zn-Mg-Er-Zr alloy under different hot deformation conditions were analyzed.

We have studied your comment carefully and made corrections and additions, hoping for your approval.