

[PO-F1]Poster Session 1

Symposium F

2018年10月29日(月) 17:45 ~ 20:00 Poster Hall

[P1-40]Alpha-phase in engineering aluminum alloys: a multiscale modeling approach to its mechanical behavior

○Duancheng Ma (Leichtmetallkompetenzzentrum Ranshofen GmbH, Austria)

Alpha-phase, i.e., Al(Fe,Mn)Si, is very common in engineering aluminium alloys. During ingot casting, coarse beta-phase forms. In the subsequent homogenization heat treatment, the beta-phase transforms into coarse alpha-phase. In the following forming and solution annealing processes, the coarse alpha-phase remains in the matrix and never dissolve. Since the size of the coarse alpha-phase is large (a few micrometers), they hardly contribute to the strengthening effect. There are many examples, however, showing that it is one of the potential damage nucleation sites. Despite being common in engineering aluminium alloys and being the damage nucleation sites, little is known about the mechanical properties of the alpha-phase. In this study, we use a multiscale modeling approach, i.e. from electronic to continuum scale, to investigate its mechanical behavior in aluminium.