Title: A STUDY OF THE COARSENING OF γ' AND γ'' PRECIPITATES HAVING A SUBCOMPACT MORPHOLOGY IN A SERIES OF ALLOYS DERIVED FROM 718

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Abstract: Previous attempts to improve the high temperature stability of alloy 718 have been based on the hypothesis that compositional modifications can increase the number of γ'' precipitates in contact with γ' precipitates and that the resulting subcompact morphology would be resistant to coarsening. In this study, simultaneous increases of the Al/Ti and (Al+Ti)/Nb ratios are shown to increase the volume fraction γ' and the fraction of γ'' precipitates sandwiched between γ' precipitates in a subcompact morphology. The apparent rate of diffusional coarsening at 760 °C in these alloys is significantly reduced relative to that of alloy 718. However, elastic interactions between precipitates result in several unforeseen microstructural changes that may compromise the effectiveness of this approach.