



Evolution of lattice mismatch in modified $AI_{10}Co_{25}Cr_8Fe_{15}Ni_{36}Ti_6$ compositionally complex alloy

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Overview over the microstructure



The γ - γ ' morphology



Pure $AI_{10}Co_{25}Cr_8Fe_{15}Ni_{36}Ti_6$ Ann 900°C 50 h

Takeuchi et al., Materials Transactions 46(2005)

The values of heat of mixing are quoted as enthalpy of mixing mix

$\Delta H \{AB\}$

of the binary liquid in an A-B system at an equiatomic composition.

B\A	AI	Со	Cr	Fe	Ni	Ti
Мо	-5	-5	0	-2	-7	-4
Zr	-44	-41	-12	-25	-49	0
Hf	-39	-35	-9	-21	-42	0
В	0	-24	-31	-26	-24	-58



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	3						















Base alloy, Peak (200), room temperture





Base alloy, Peak (200), room temperture

















Difficulties - Peak shapes before and after experiment



before

20 [°]

Evolution of the lattice parameters



The γ - γ ' morphology







Pure Al₁₀Co₂₅Cr₈Fe₁₅Ni₃₆Ti₆ Ann 900°C 5 h Ann 900°C 50 h

With 1 at.% Mo

With 1 at.% Mo Ann 900°C 100 h



With 1 at.% Zr Ann 900°C 5 h



With 0.5 at.% Hf Ann 900°C 50 h



With 0.5 at.% B Ann 900°C 100 h

Evolution of the lattice parameters





-Measuring the lattice misfit requires high precision tools... and a lot of time to exploit the results!

Thank you!