

Table S1: Summary of microstructures in arc melted, suction cast and OFZ alloy CM1

Alloy CM1-	Condition	
	As cast	Heat treated
10 g	$Nb_{ss}$ , $\beta Nb_5Si_3$ $Nb_{ss} + \beta Nb_5Si_3$ eutectic	$Nb_{ss}$ , $\alpha Nb_5Si_3$ $Nb_{ss} + \alpha Nb_5Si_3$ lamellar microstructure subgrains in $Nb_5Si_3$ and fine precipitates
6mm	$Nb_{ss}$ , $\beta Nb_5Si_3$ $Nb_{ss} + \beta Nb_5Si_3$ eutectic	$Nb_{ss}$ , $\alpha Nb_5Si_3$ $Nb_{ss} + \alpha Nb_5Si_3$ lamellar microstructure subgrains in $Nb_5Si_3$ and fine precipitates
8mm	$Nb_{ss}$ , $Nb_3Si$ , $\beta Nb_5Si_3$ $Nb_{ss} + \beta Nb_5Si_3$ eutectic $Nb_3Si \rightarrow Nb_{ss} + \alpha Nb_5Si_3$	$Nb_{ss}$ , $\alpha Nb_5Si_3$ $Nb_{ss} + \alpha Nb_5Si_3$ lamellar microstructure subgrains in $Nb_5Si_3$ and fine precipitates
600 g	$Nb_{ss}$ , $\alpha Nb_5Si_3$ $Nb_{ss} + \alpha Nb_5Si_3$ lamellar microstructure subgrains in $Nb_5Si_3$ and fine precipitates	$Nb_{ss}$ , $\alpha Nb_5Si_3$ $Nb_{ss} + \alpha Nb_5Si_3$ lamellar microstructure subgrains in $Nb_5Si_3$ and precipitates
OFZ All growth rates	$Nb_{ss}$ , $\alpha Nb_5Si_3$ $Nb_{ss} + \alpha Nb_5Si_3$ lamellar microstructure Fine precipitates in $\alpha Nb_5Si_3$	$Nb_{ss}$ , $\alpha Nb_5Si_3$ $Nb_{ss} + \alpha Nb_5Si_3$ lamellar microstructure subgrains in $Nb_5Si_3$ and fine precipitates

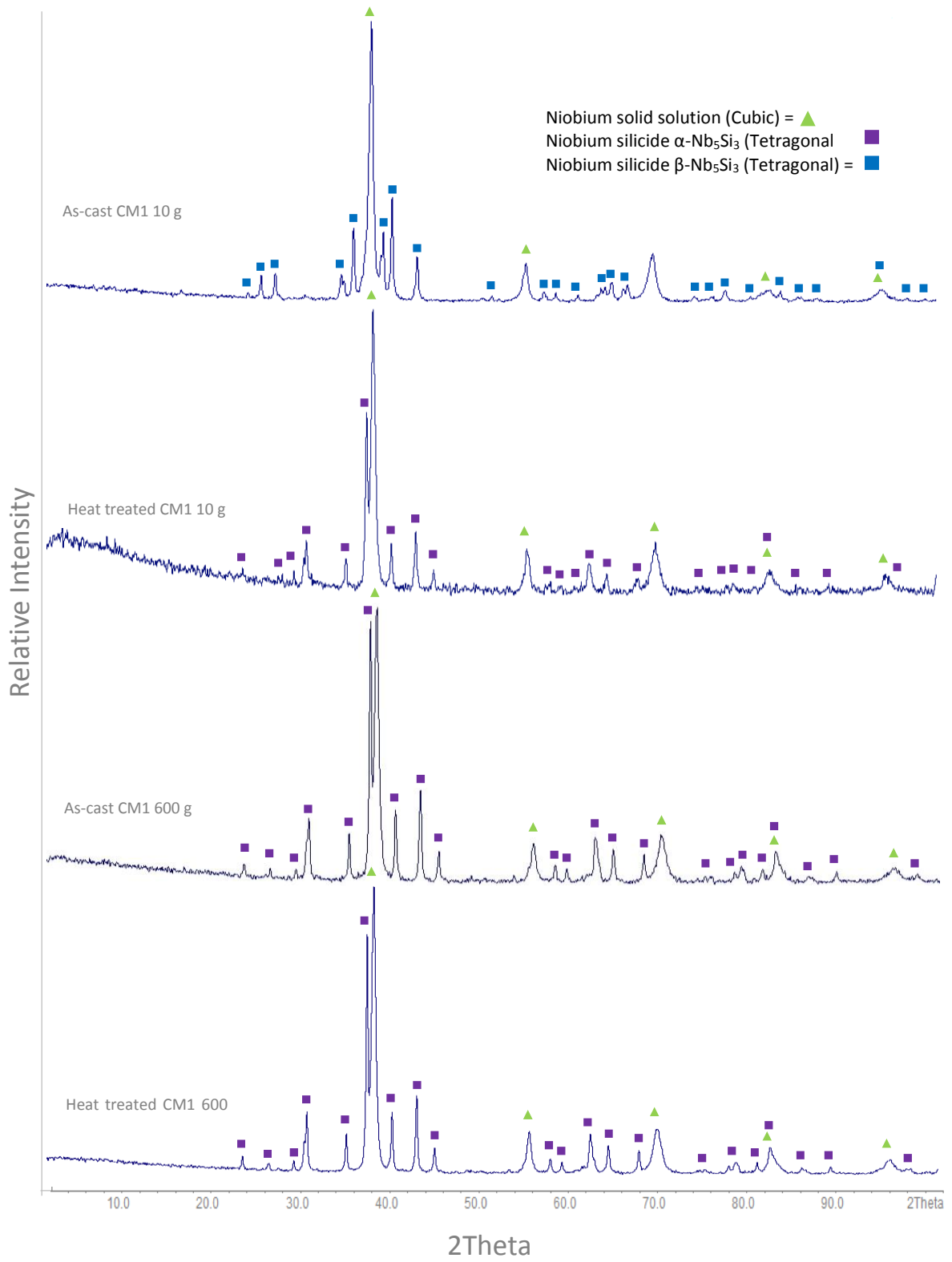


Figure S1: X-ray diffractograms of cast and heat treated CM1-10g and CM1-600g

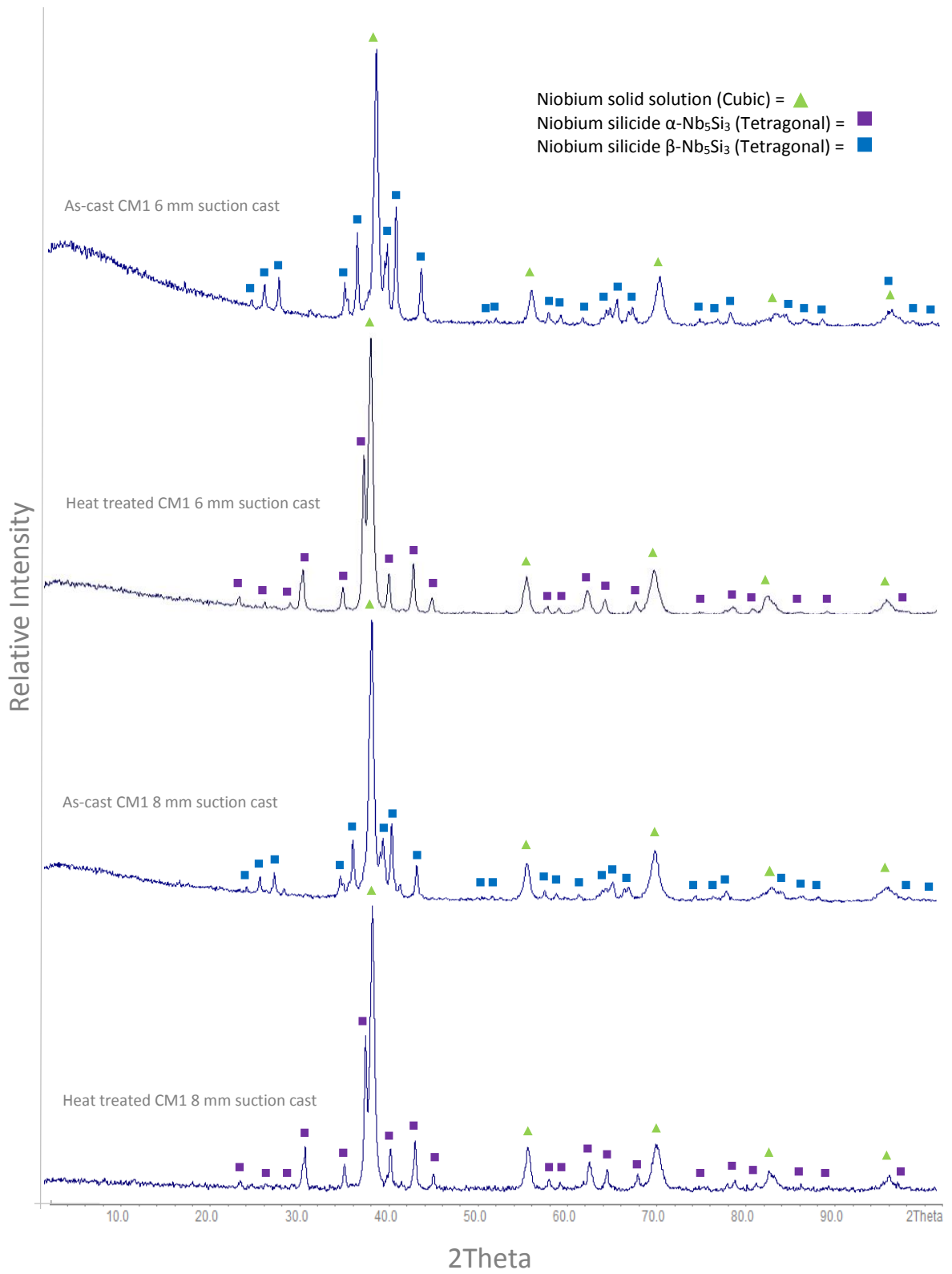


Figure S2: X-ray diffractograms of cast and heat treated CM1-6mm and CM1-8 mm bars

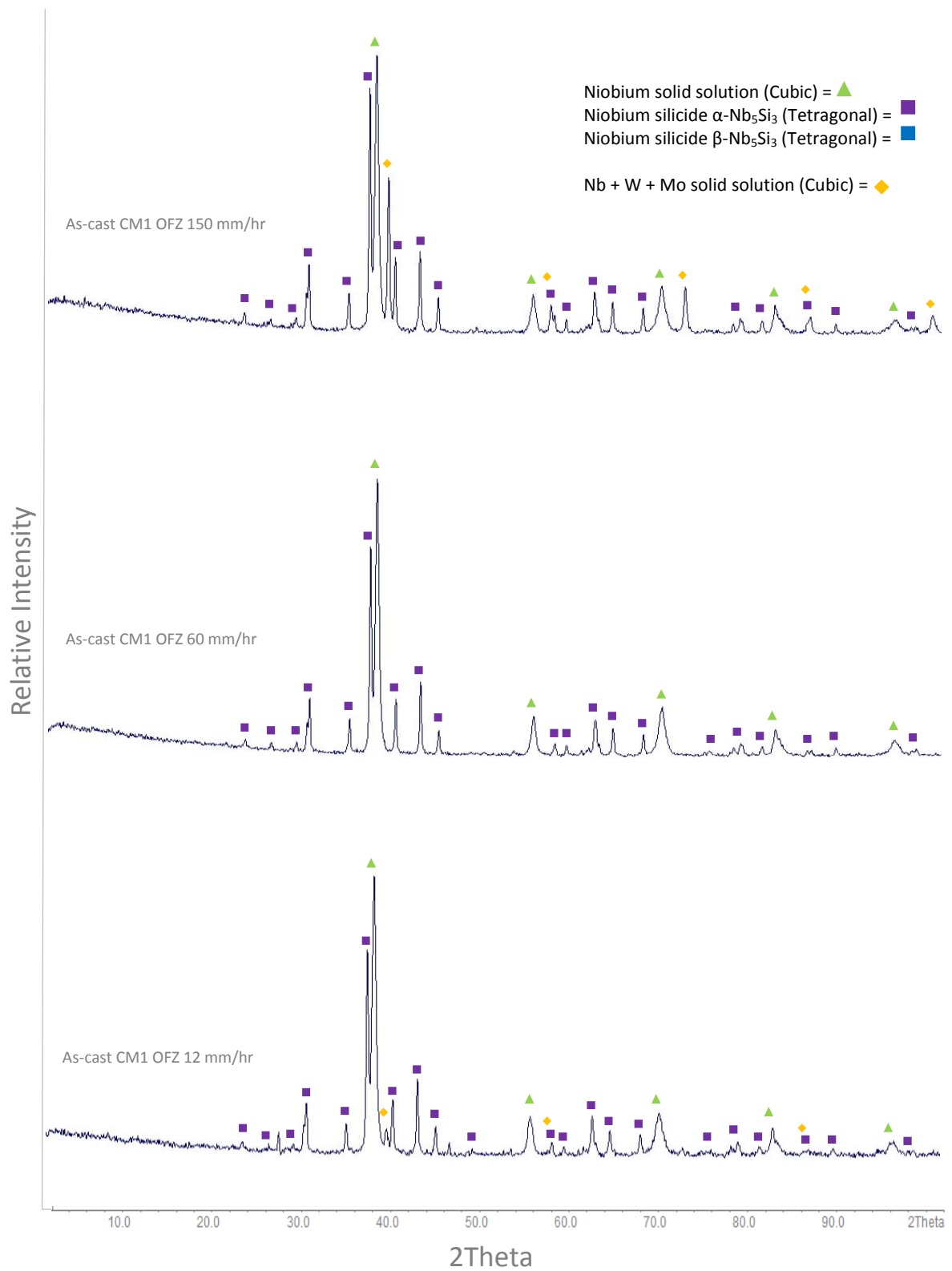


Figure S3: X-ray diffractograms of cast CM1-OFZ grown at growth rates of 12, 60 and 150 mm/h.

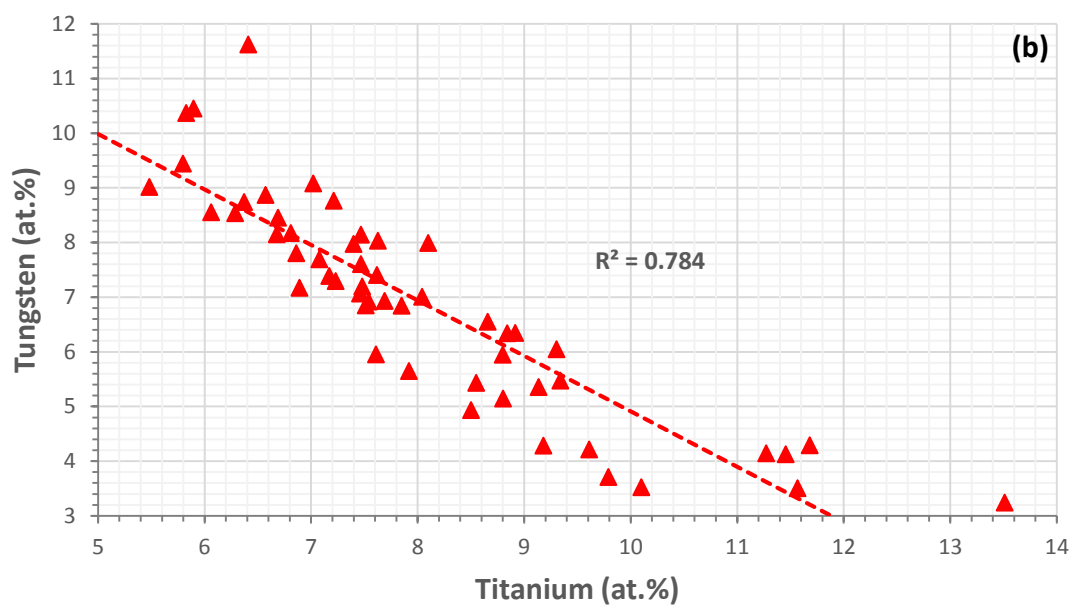
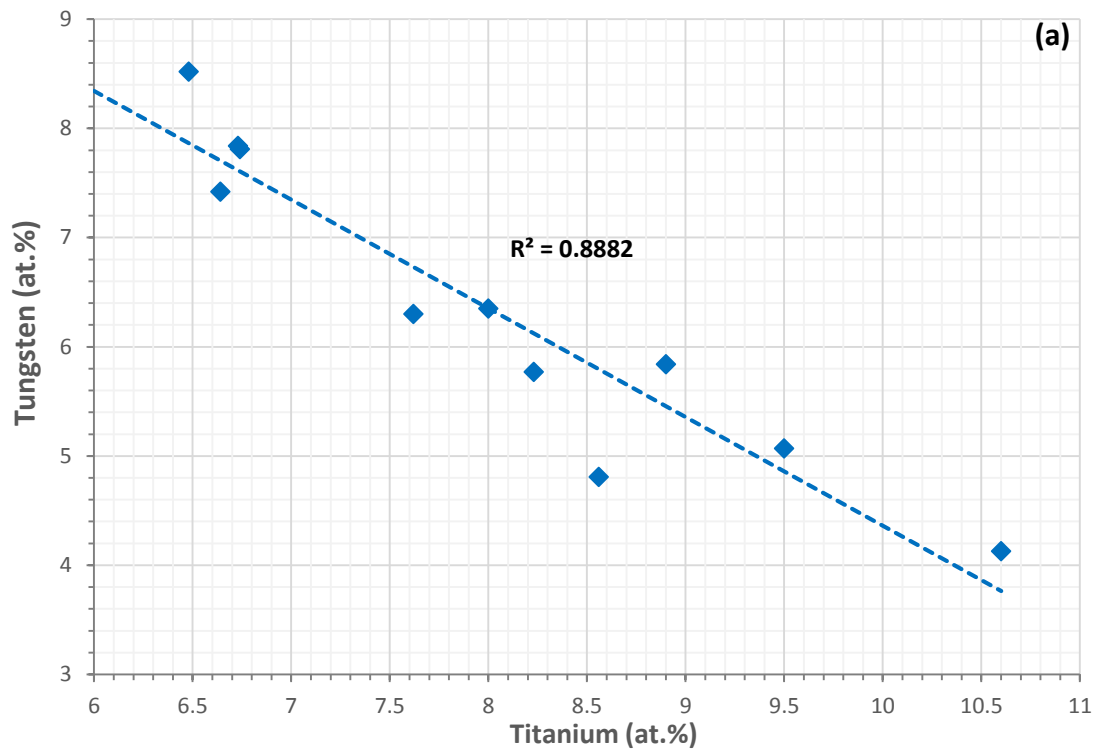


Figure S4: Relationships between W and Ti concentrations in the Nb<sub>ss</sub> (a) in as-cast CM1-10g and (b) CM1-OFZ where data for all three growth rates is included.

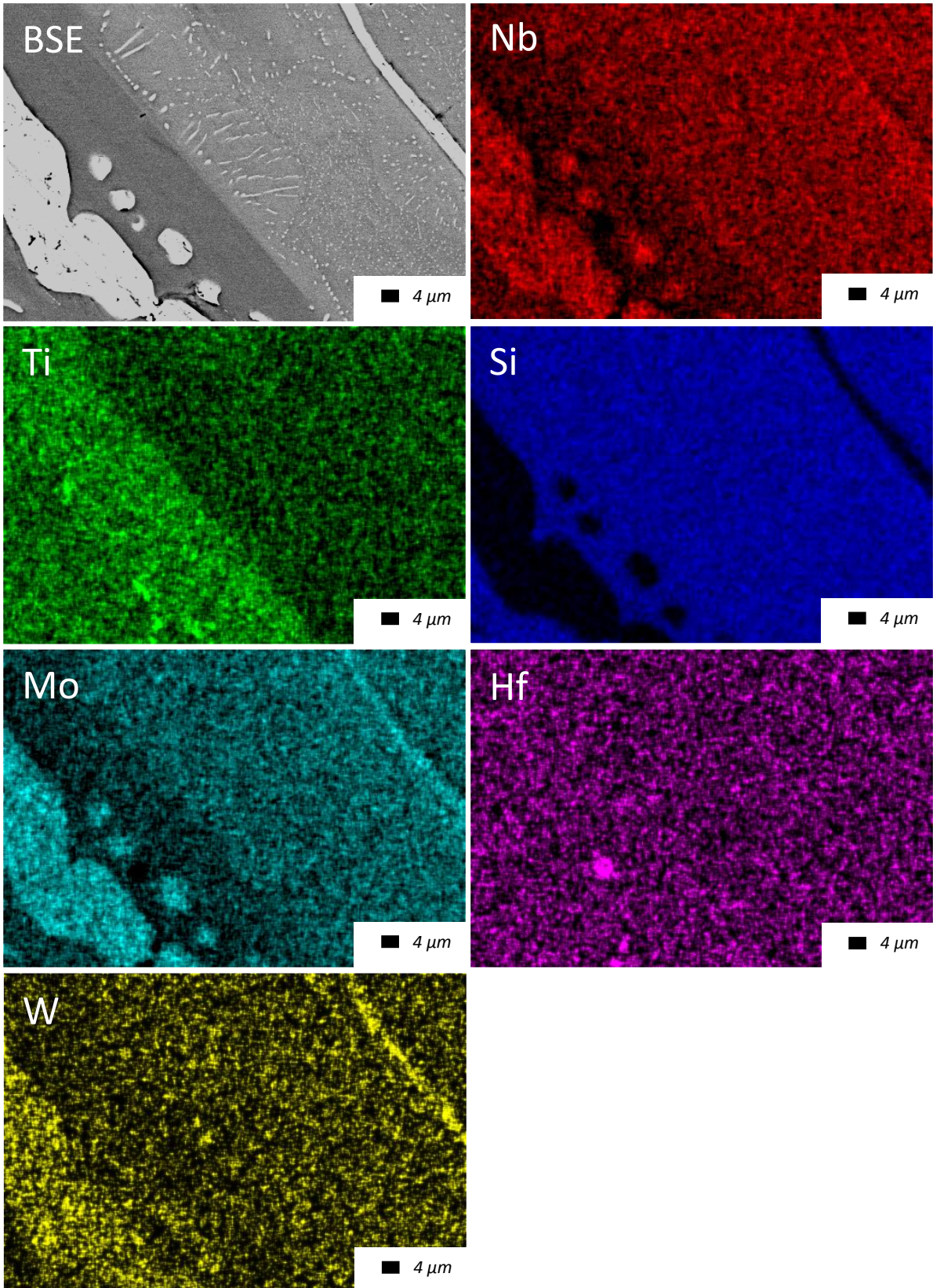


Figure S5: Backscattered electron image of a silicide in as-cast CM1-OFZ grown at 150 mm/hr and X-ray maps of the elements in the alloy.

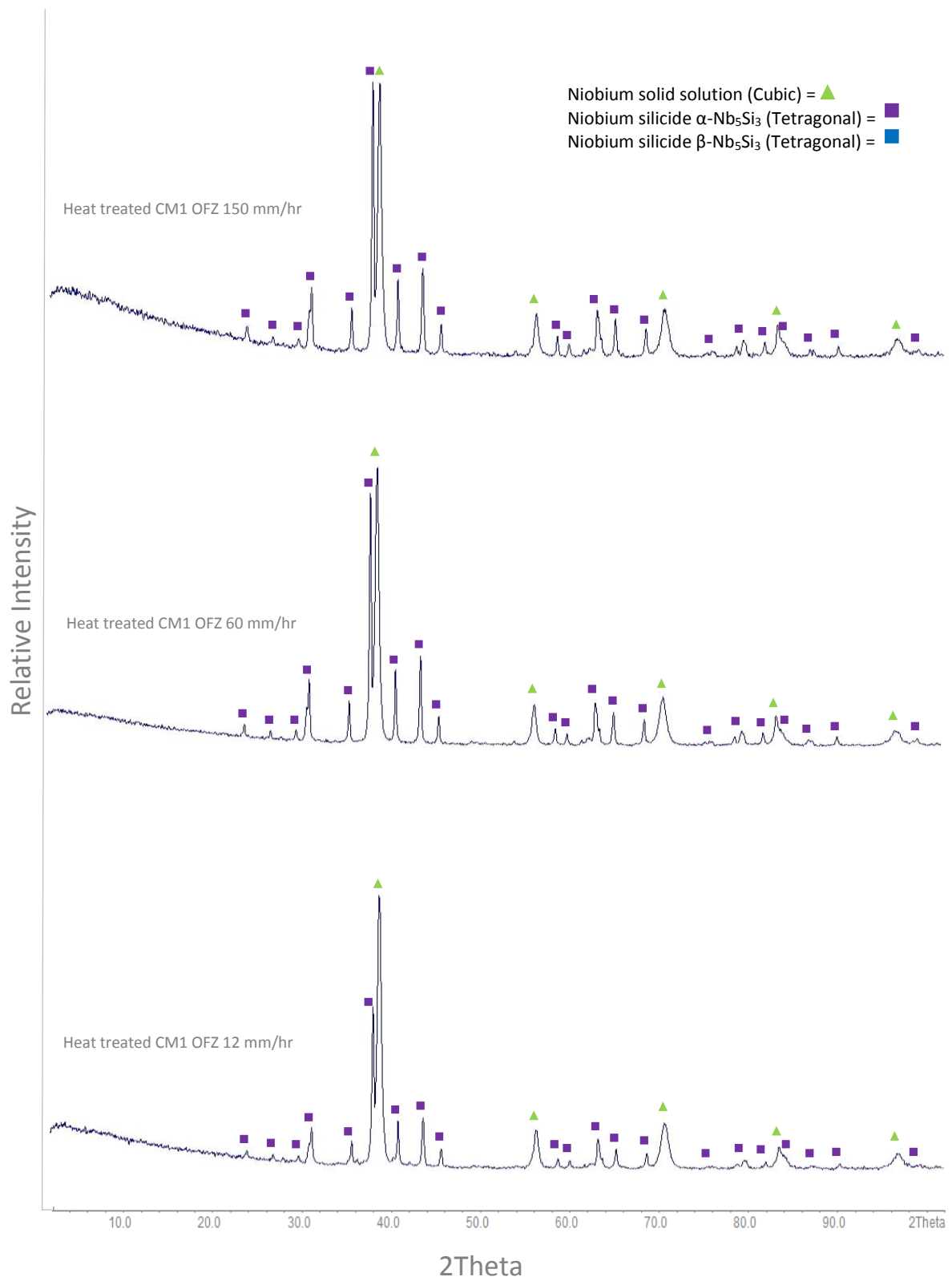


Figure S6: X ray diffractograms of heat treated CM1-OFZ grown at 12, 60 and 150 mm/h