Supplementary Information

Excellent electromagnetic wave absorption performances of $FeCoNiAlTi_x$ high-entropy alloys with superior oxidation resistance

Yansi Wang[1], Liyang Fang[2], Chenran Xu[1], Xiaoling Chen[1], Zhiyou Lu[1], Guanglong Xu[3], Lingwei Yang[4], Yifang Ouyang[1], Xiaoma Tao[1,*]

1. *School of Physical Science and Technology, Guangxi Key Laboratory for Relativistic Astrophysics, State Key Laboratory of Featured Metal Materials and Life-cycle Safety for Composite Structures, Guangxi University, Nanning 530004, P.R. China*
2. *Nanning Engineering Technology Research Center for Power Transmission System of New Energy Vehicle, College of Traffic and Transportation , Nanning University, Nanning，530200, P.R. China*
3. *Tech Institute of Advanced Materials & College of Materials Science and Engineering, Nanjing Tech University, Nanjing 211816, P. R. China*
4. *Hypervelocity Aerodynamics Institute, National Key Laboratory of Aerospace Physics in Fluids, China Aerodynamics Research and Development Center, Mianyang, 621000, P. R. China*

*Correspondence: taoxiaoma@gxu.edu.cn (X.T.)

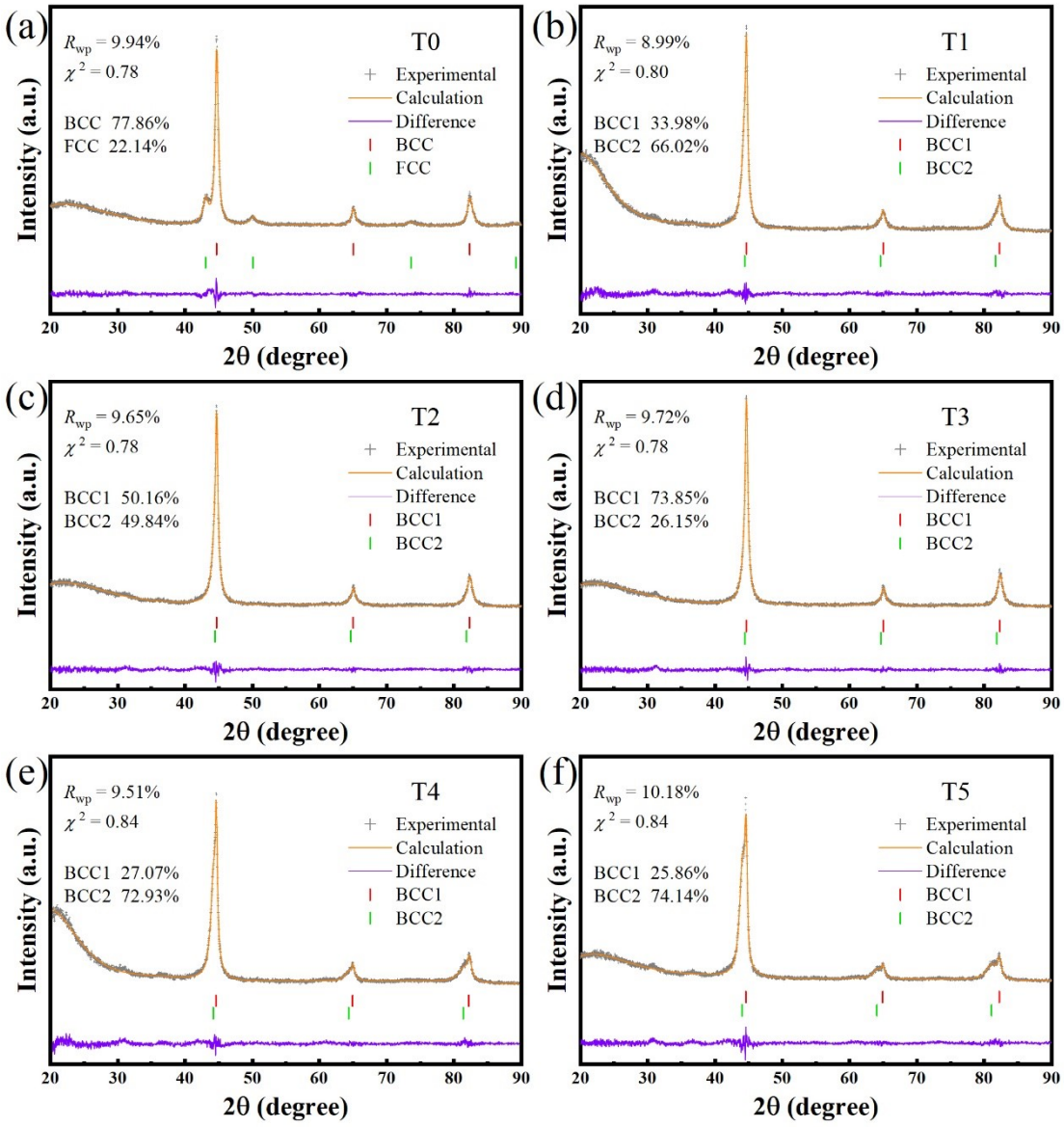

Fig. S1. Comparison of XRD patterns for T0, T1, T2, T3, T4, and T5 after Rietveld refinement.

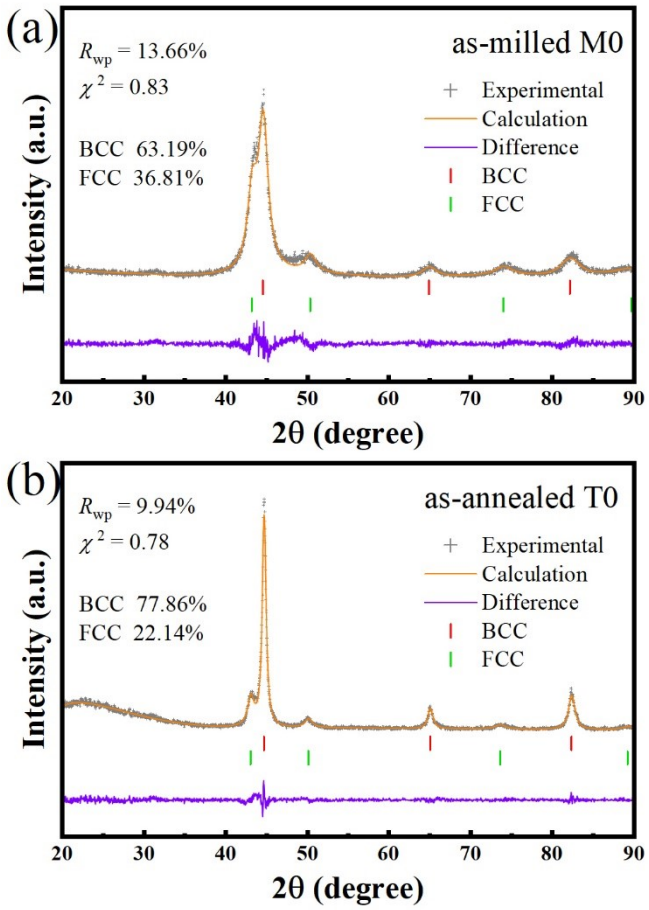

Fig. S2. Comparison of XRD patterns for M0, T0 after Rietveld refinement.

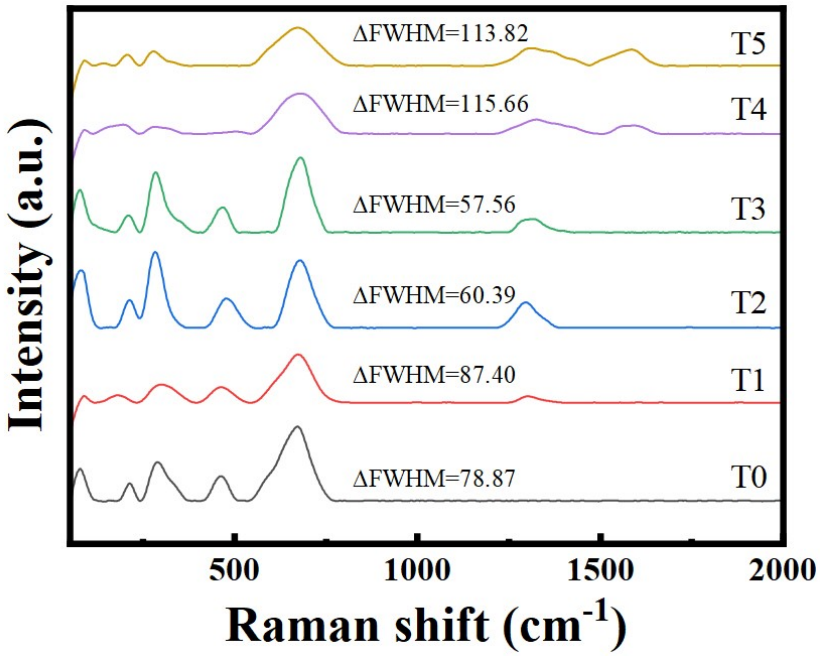

Fig. S3. Raman spectra of annealed FeCoNiAlTi$_x$ HEA powders.

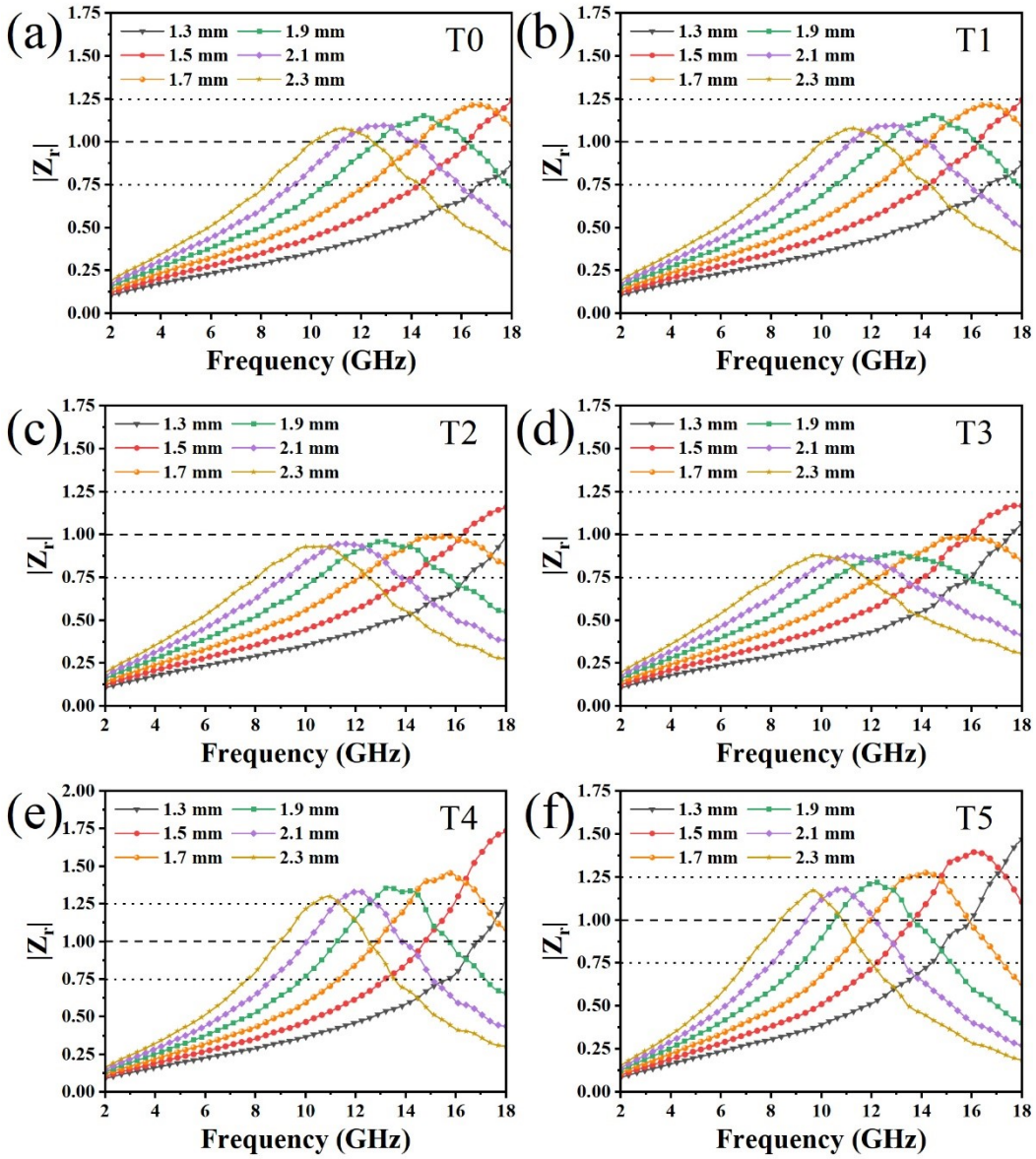

Fig. S4. Impedance matching of annealed FeCoNiAlTi$_x$ HEA powders filled with 33.3 wt.% paraffin.

Table S1 Grain size, internal stress, dislocation density, and microstrain of $FeCoNiAlTi_x$ HEAs in as-milled and annealed states.

Sample	Grain size (nm)	Internal stress (GPa)	Dislocation density ($\times 10^{-3}$ nm^{-2})	Microstrain ($\times 10^{-3}$)
M0	4.5559	0.3337	48.1791	15.3134
M1	4.3469	0.8451	52.9228	17.4406
M2	4.7804	0.6824	43.7598	14.7878
M3	4.7367	0.6036	44.5703	17.8619
M4	4.5551	0.4165	48.1948	18.3804
M5	4.3725	0.6866	52.3058	19.5842
T0	12.9926	0.0114	5.9240	5.5629
T1	12.0276	0.0782	6.9127	8.2390
T2	12.4269	0.1623	6.4756	7.7453
T3	13.6008	0.1053	5.4059	6.5916
T4	11.4479	0.3932	7.6304	8.6431
T5	10.1485	0.1949	9.7095	8.7782

Table S2 Theoretical density of $FeCoNiAlTi_x$ HEAs.

Alloys	Theoretical density (g/cm^3)
FeCoNiAl	7.0952
$FeCoNiAlTi_{0.2}$	6.9735
$FeCoNiAlTi_{0.4}$	6.8629
$FeCoNiAlTi_{0.6}$	6.7619
$FeCoNiAlTi_{0.8}$	6.6694
FeCoNiAlTi	6.5842