*Supplementary note*

**Microstructure and Magnetic behavior of FeCoNi (Mn-Si)x(x= 0.5,0.75,1.0) High Entropy Alloys**



Fig A1: systematically basic circuit of transformer



Fig A2(a):(a) H-B curve of soft iron (without loss) ,(b) H-B curve of FeCoNi(Mn-Si)0.5 after 25hrs milling, (c) H-B curve of FeCoNi(Mn-Si)0.75 after 25hrs milling,(d) H-B curve of FeCoNi(Mn-Si)1.0 after 25hrs milling



Figure A3:(a & b) shows induced voltage in primary coil and secondary coil in soft iron and

(c & d) Induced voltage in primary coil and secondary coil FeCoNi(Mn-Si)0.5, FeCoNi(Mn-Si)0.75and FeCoNi(Mn-Si)1.0HEAs

The deconvoluted peak of 25hour as milled powders of FeCoNi(Mn-Si)0.5, FeCoNi(Mn-Si)0.75 and FeCoNi(Mn-Si)1.0 HEAs respectively.



Fig.A4 (a) Deconvoluted peak of 25hour of FeCoNi(Mn-Si)0.5 , (b) Deconvoluted peak of 25hour of FeCoNi(Mn-Si)0.75and (c) Deconvoluted peak of 25hour of FeCoNi(Mn-Si)1.0