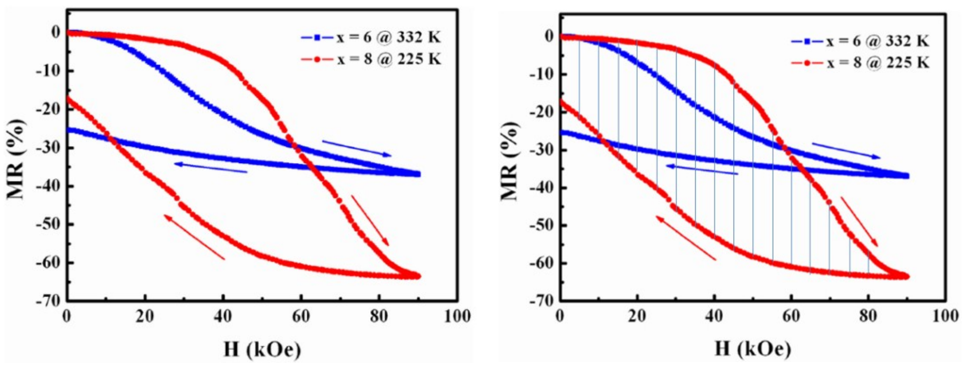
Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

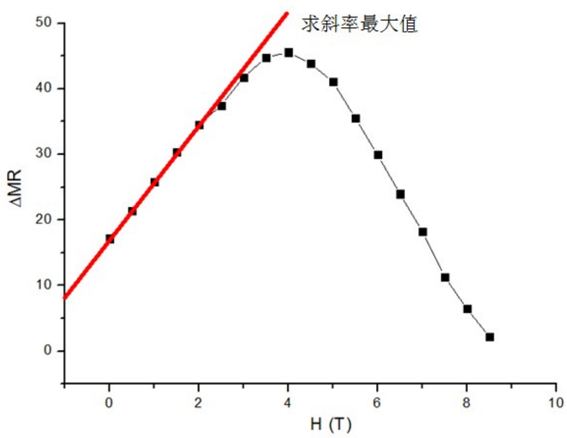
Supplementary materials 2:

The data calculation process of verifying the Ref. 22, 23:

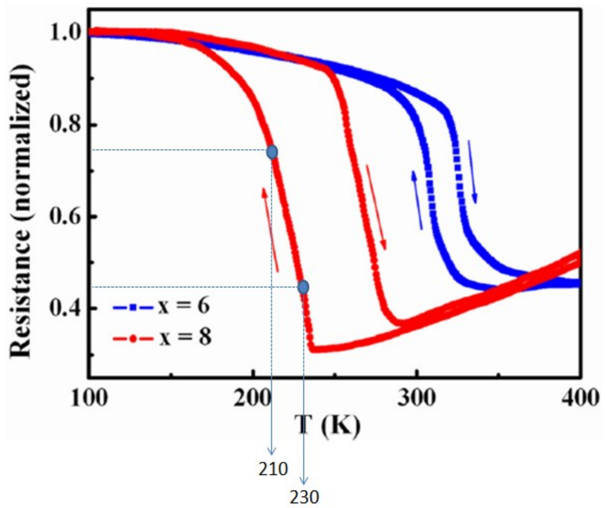
1、Get the ΔR(H) value at different magnetic fields on the curve of x=8 in Fig.4 in the Ref. 22.



2、Draw the curve of the H dependence of $\Delta R(H)$, and calculate the maximum slope of the curve $\left(\frac{dR}{dH}\right)_{max} = 8.79\ (\%/T)$.



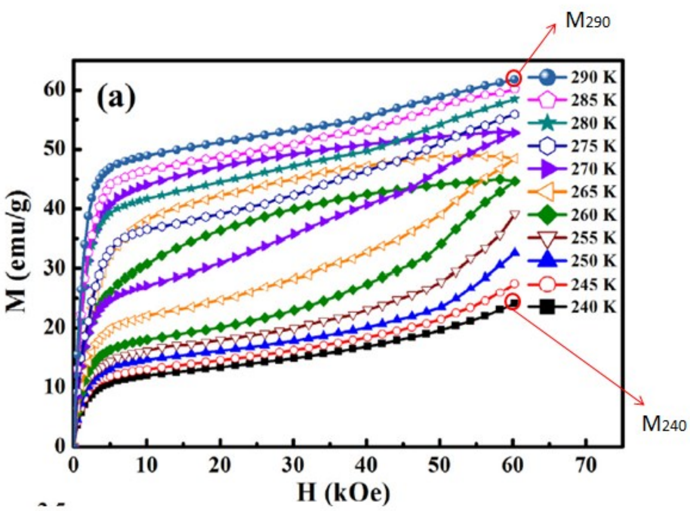
3、Select the R of 210 K and 230 K on the cooling curve of x=8 in Fig.2 in the Ref. 22, and calculate the $\frac{dR}{dT} = 1.54\ (\%/K)$.



4、The equation (3) in this article is used to calculate the

$$\gamma = \left(\frac{\Delta R}{dH}\right)_{max} \Big/ \left(\frac{\Delta R}{\Delta T}\right) = 5.71 \text{ (K/T)}.$$

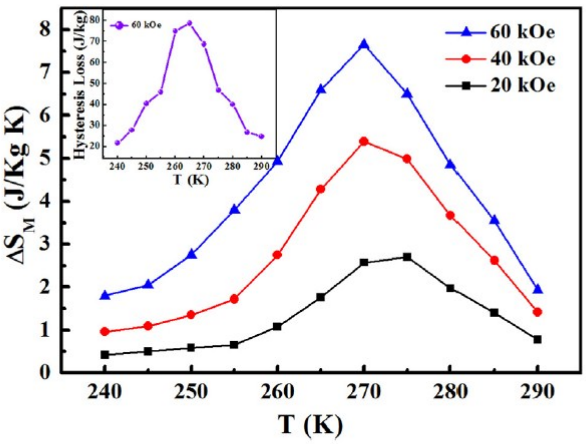
5、Now we compare the experimental result of Ref.22 with the γ result. The change of magnetization between the parent phase and the martensitic one was drawn the data from Fig.3(a) of Ref.23, the difference in magnetization of $Ni_{42}Co_8Mn_{32}Al_{18}$ between 290K and 240K taken at 6 T. That is $\Delta M = M_{290} - M_{240} = 37.32$ emu/g.



$$\Delta M = M_{290} - M_{240} = 37.32\ \ emu/g$$

6、The magnetic entropy change of the alloy was 7.7 J/Kg/K at 6 T drawn from Fig.4

of Ref. 23.



7、Therefore, the $\frac{dT}{dH} = -\frac{\Delta M}{\Delta S} = 4.847\ K/T$ from the equation (13).

8、This result 4.847K/T is closed to that calculated from MR curves, 5.71K/T. Since the thermomagnetization curves at 6T was not given in the literature, we just use the data at 290K and 240K to calculate the ΔM. The magnitude of ΔM may be a little bit smaller than the actual value, and brought about the smaller value of ΔM/ΔS.