

From magnetic cluster glass state to giant vertical magnetization shift induced by ferromagnetic cluster growth in $\text{SrFe}_{0.25}\text{Co}_{0.75}\text{O}_{2.63}$

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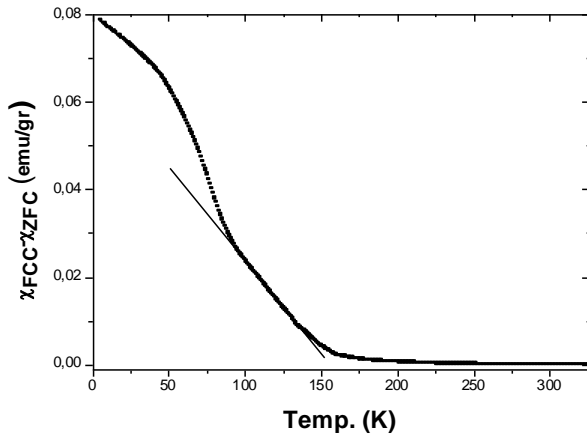
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Supplementary material S1 :

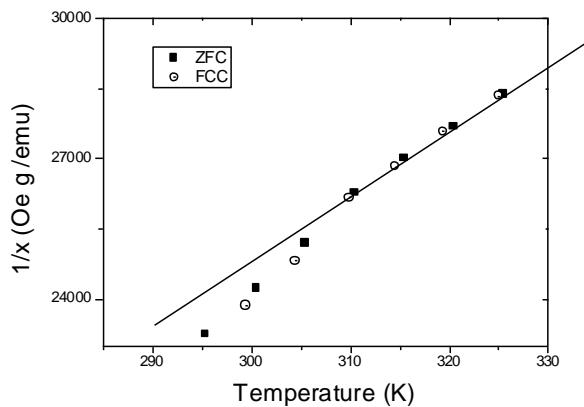
Difference between the DC magnetic susceptibility curves collected in a ZFC & FCC process under 100 Oe.

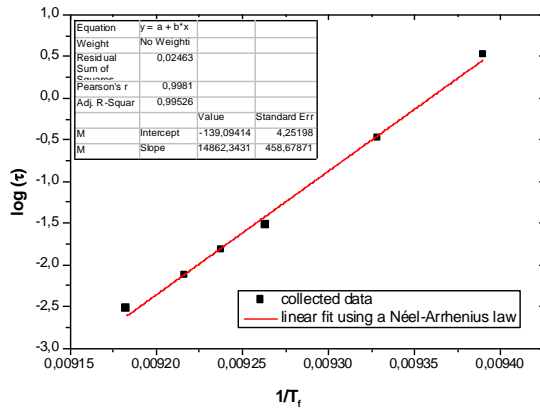
The solid line is a guide for eyes highlighting an asymptotic behavior starting around 150K.



Supplementary material S2 :

Inverse magnetic susceptibility around 310K showing the first deviation from a linear behavior that is expected by the paramagnetic Curie-Weiss law.





Supplementary material S3 :

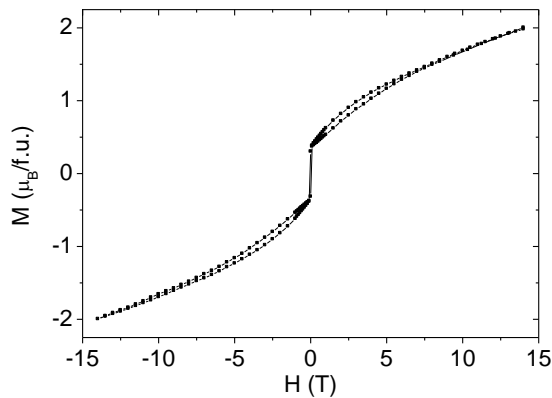
The frequency dependence of freezing temperature plotted as $\log(\tau)$ vs $1/T_f$.

Table gives the fit parameters obtained from the Néel-Arrhenius law

The data were first fitted with a Néel-Arrhenius law given by

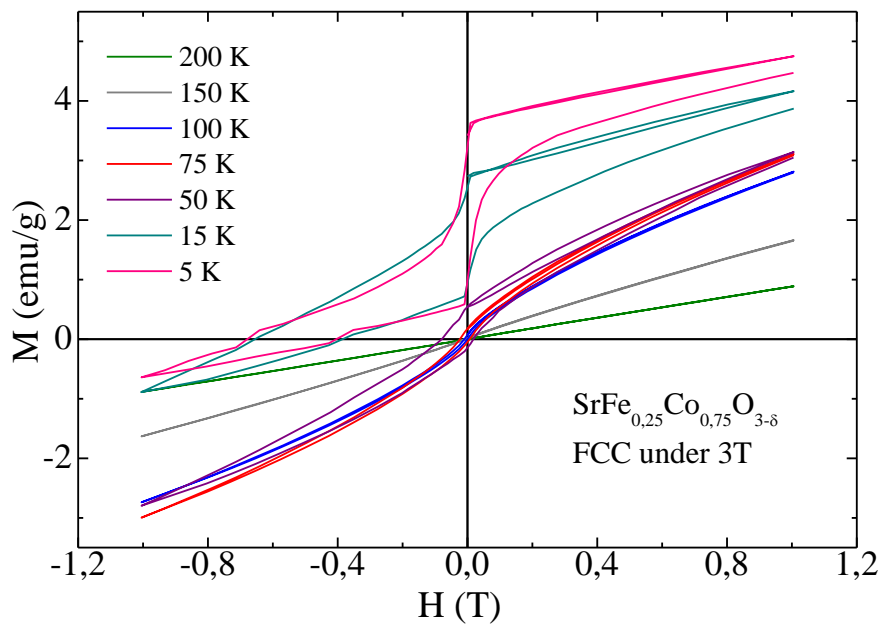
$$\tau = \tau_0 \exp\left(\frac{E_a}{K_B T_f}\right)$$

where, τ_0 is the characteristic attempt time, E_a is the average thermal activation energy and k_B is the Boltzmann constant. A linear behavior is seen in $\log\tau$ versus $1/T_f$ plot in supplementary material S3 figure but both E_a/k_B and τ_0 extracted parameters from the slope and intercept respectively give totally unphysical parameter for a characteristic fluctuation time scale ($\tau_0 \sim 4.10^{-61}$ s) and for a barrier energy height ($E_a \sim 14862$ K).



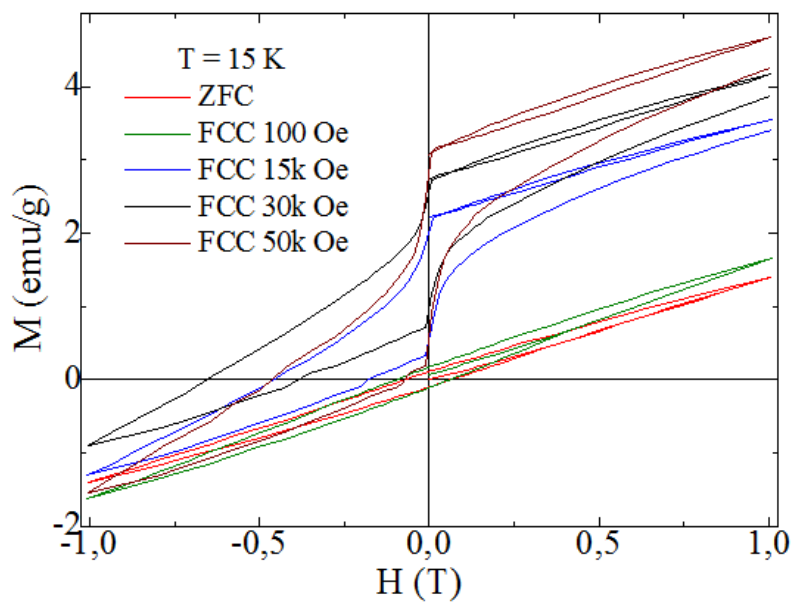
Supplementary material S4 : Isothermal magnetization curves at 10K after ZFC. The data acquisition starts at 14T.

The hysteresis loop at large magnetic field was recorded using the VSM option of the PPMS equipped with a 14T solenoid.



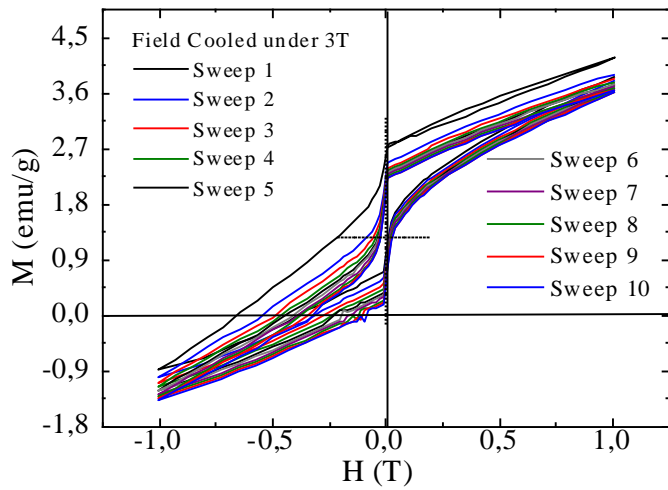
Supplementary material S5:

Isothermal magnetization curves at different temperature after cooling the sample from RT under 3T.



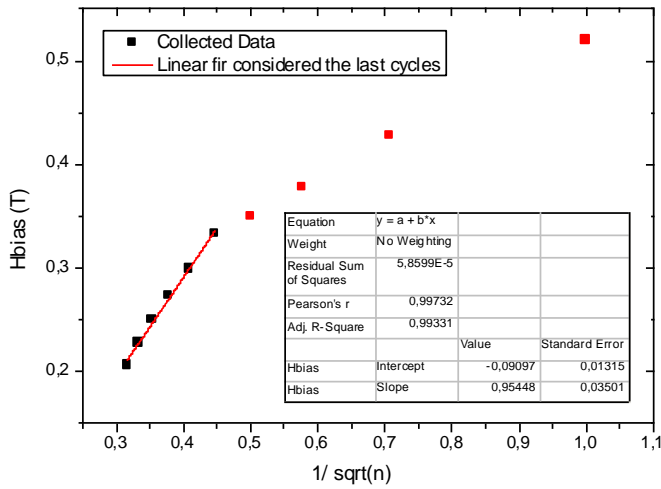
Supplementary material S6:

Isothermal magnetization curves at 15K after cooling the sample from RT under different magnetic excitation.



Supplementary material S7 :

Isothermal magnetization curves up to 10 consecutive cycles at 15K after cooling the sample from RT under 3T.



Supplementary material S8 :

The H_{bias} dependence versus the number of cycles following the quantitative power law given by

$$H_{bias}(n) - H_{E\infty} = \kappa/\sqrt{n}.$$

The solid line is a linear fit of the quantitative power law only considering the higher cycles.