

## MAGNETIC DOMAINS OBSERVATIONS OF CUSTOM ASSEMBLED FECo NANOGRAINS MICROSTRUCTURES TAILORED BY MEANS OF COBALT PERCENTAGE AND ANNEALING MAGNETIC FIELD DIRECTION

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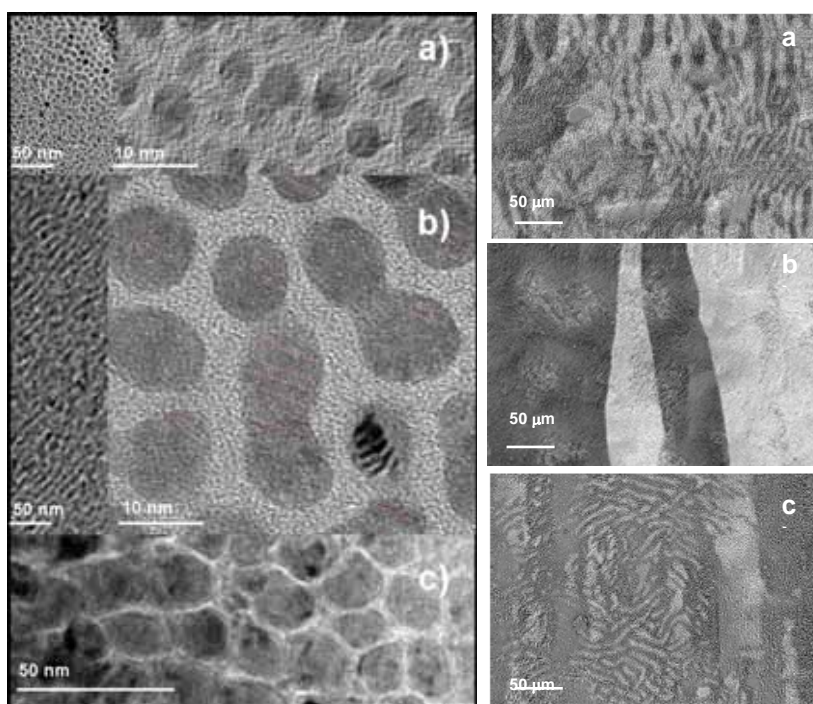
As reported in previous works [1,2] it is possible to tune the nanocrystalline microstructure of Co-rich samples by magnetic field annealing. Nanocrystalline grains can be directionally ordered by thermal annealing of amorphous ribbons in the presence of magnetic field. The intensity of the field allows controlling different degrees of order. The effect is observed when the annealing temperature corresponds to the first stages of nanocrystallization process associated with temperatures between 713 K and 753 K. The field effect can be described by a relative increase of the crystallized volume fraction and a linear alignment of the nucleated grains. The energy barrier for nucleation is directionally affected by the applied field. The influence of grains assembling on exchange coupling between grains has been analysed by means of magnetic domains observation and magnetic properties study.

### References:

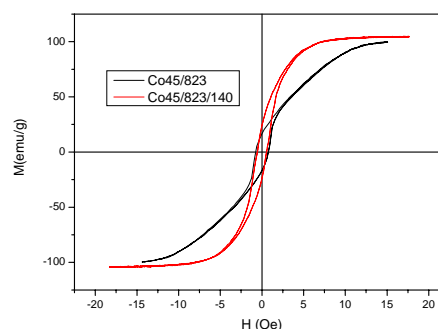
[1] P. Marín, M. López, A. Vlad, A. Hernando, M. L. Ruiz-González and J. M. González-Calbet, Applied Physics Letter, **Issue 89**,(2006) page 1

[2] G. Herzer, Nanocrystalline Soft Magnetic Alloys, Handbook of Magnetic Materials (Eds. Busckow K.H.J, Elsevier Science B.-V., The Neherlands), **Vol 10** (1997) page 415

### Figures:



**Fig1.-** HRTEM observation of magnetic grains and corresponding magnetic domains obtained by Kerr effect: FeCo sample annealed without field (a), under 50 Oe (b) and 140 (Oe)



**Fig 2.-** Influence of custom assembly on Hysteris loop: FeCo sample annealed without magnetic field (-),and under 140 Oe (- -) longitudinal field