Development of Ferromagnetic Materials Containing Co_2P, Fe_2P Phases from Organometallic Dendrimers Precursors

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Electronic Supporting Information

Table S1: Refined lattice parameters for crystalline phases identified on XRD patterns of magnetic homometallic samples.

Chemical Name	Formula	Space Group	*a* (Å) α (°)	*b* (Å) β (°)	*c* (Å) γ (°)	Reference
ε-Iron Phosphide (3/1)	Fe_3P	*I* -4	9.106(8) 90	9.106(8) 90	4.460(4) 90	[59]
Iron Phosphide (2/1)	Fe_2P	*P* -6 2 *m*	5.866(5) 90	5.866(5) 90	3.457(3) 120	[60]
Iron(III) Phosphide	FeP	*P n m a*	5.191(4) 90	3.098(3) 90	5.790(5) 90	[61]
Iron BCC	Fe	*I m* -3 *m*	2.866(2) 90	2.866(2) 90	2.866(2) 90	-
Triiron Bis(phosphate(V))	$Fe_3(PO_4)_2$	*P* $2_1/c$	8.714(16) 90	11.175(19) 99.71(13)	6.248(12) 90	[62]
Diiron Diphosphate(V)	$Fe_2(P_2O_7)$	*P* 1	4.477(4) 103.52(5)	5.285(5) 98.32(4)	5.490(5) 98.37(4)	[63]

Table S2. Refined lattice parameters for crystalline phases identified on XRD patterns of magnetic heterometallic samples.

Chemical Name	Formula	Space Group	*a* (Å) α (º)	*b* (Å) β (º)	*c* (Å) γ (º)	Reference
Cobalt Phosphide (2/1)	Co_2P	*P n m a*	5.6815(3) 90	3.5193(2) 90	6.6086(4) 90	[64]
Iron FCC	Fe	*F m* -3 *m*	3.5685(1) 90	3.5685(1) 90	3.5685(1) 90	-
Cobalt FCC	Co	*F m* -3 *m*	3.55715(8) 90	3.55715(8) 90	3.55715(8) 90	-
Cobalt HCP	Co	*P* 6_3/*m m c*	2.470(3) 90	2.470(3) 90	4.035(11) 120	-
Iron BCC	Fe	*I m* -3 *m*	2.8440(1) 90	2.8440(1) 90	2.8440(1) 90	-
Cobalt Phosphide (2/1) - Beta	Co_2P	*P* -6 2 *m*	5.7867(2) 90	5.7867(2) 90	3.4369(2) 120	[65]

Table S3: Show Crystal size in Å and Crystallinity of magnetic homometallic samples

	Fe_3P	**Fe_2P**	**FeP**	**Fe**	**$Fe_3(PO_4)_2$**	**$Fe_2(P_2O_7)$**	**Crystallinilty**
HOMO_G1	805	735		415	56	132	72.54%
HOMO_G2	367	370	513	319	67	132	65.54%
HOMO_G3	-	857	885	-	-	187	76.15%
HOMO_G4	-	518	621	-	-	129	80.10%

Table S4. Show Crystal size in Å and Crystallinity of magnetic heterometallic samples.

	Co_2 P	**Fe-FCC**	**Co-FCC**	**Co-HCP**	**Fe-BCC**	**Co_2P-β**	**Crystallinilty**
HETERO_G1	376	417	417	-	220	254	75.92%
HETERO_G2	467	417	417	-	330	628	76.51%
HETERO_G3	367	273	713	232	256	-	75.30%
HETERO_G4	536	345	598	232	437	-	86.23%

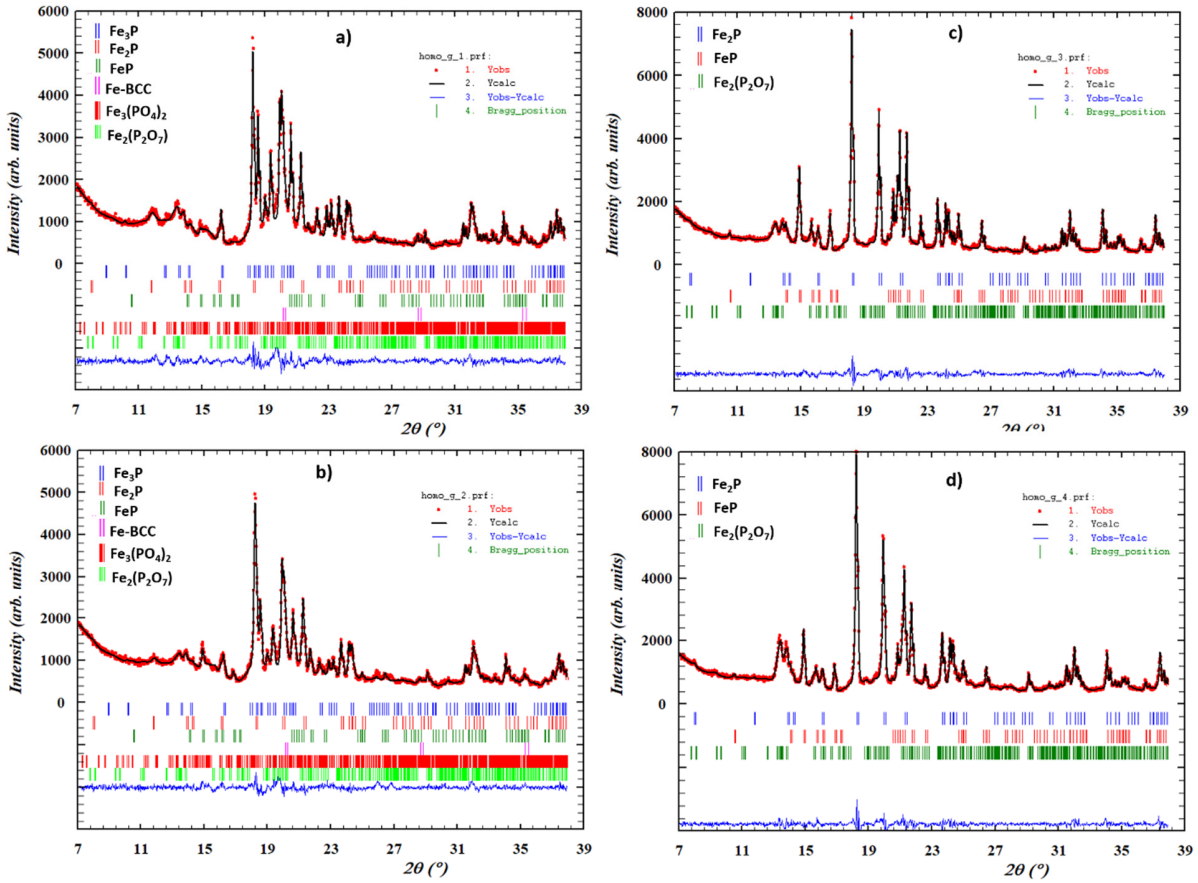

Figure S1. Whole pattern profile fit for the X-ray diffraction pattern of : a)HOMO-G1, b) HOMO-G2, c) HOMO-G3 and d) HOMO-G4 by means Rietveld method: observed (red points) and calculated (black line). Positions of the Bragg reflections are depicted by green vertical bars (arranged in rows for each phase) and the observed-calculated difference is showed by blue line at the bottom.

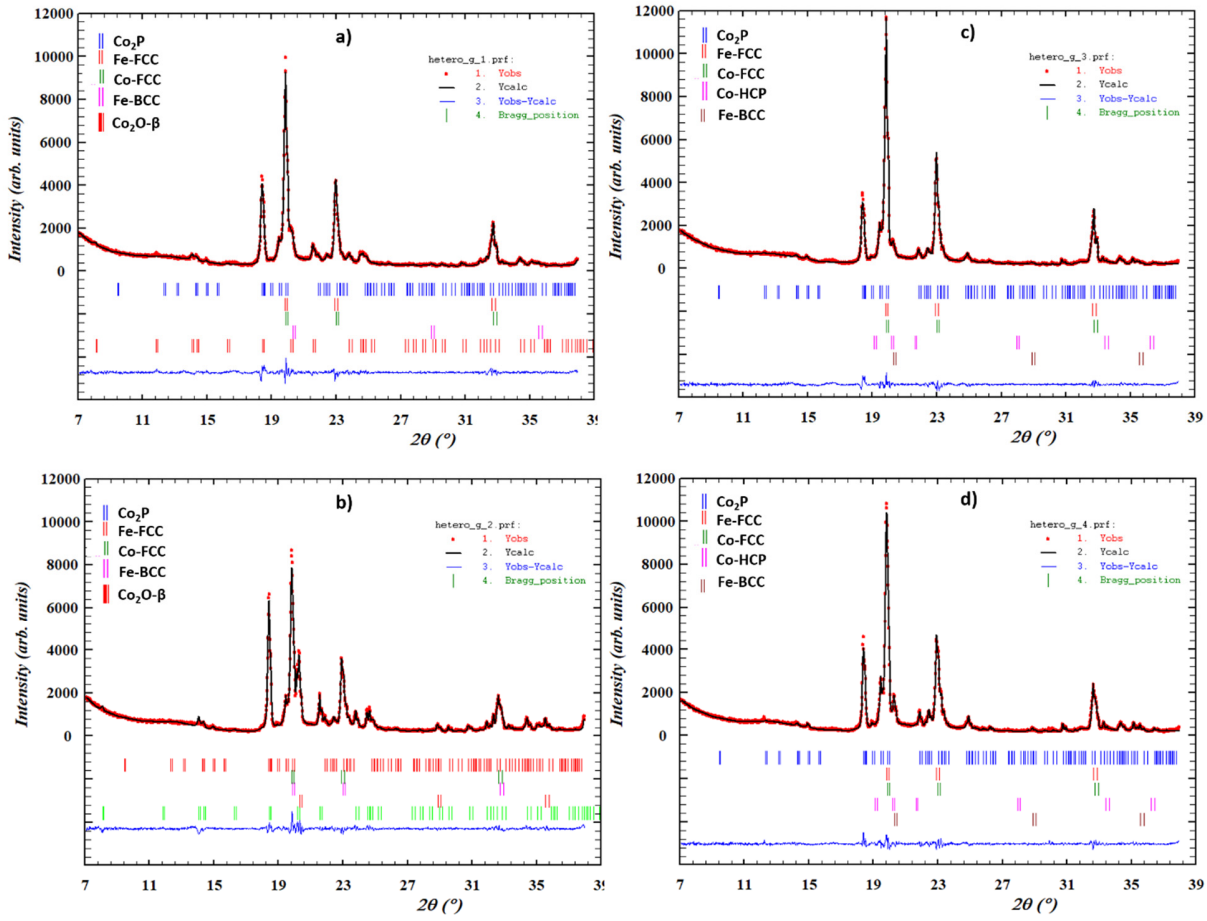

Figure S2. Whole pattern profile fit for the X-ray diffraction pattern of a)HETER-G1, b) HETERO-G2, c) HETERO-G3 and d) HETERO-G4 by means Rietveld method: observed (red points) and calculated (black line). Positions of the Bragg reflections are depicted by green vertical bars (arranged in rows for each phase) and the observed-calculated difference is showed by blue line at the bottom.