Synthesis of Metallic and Metal Oxides Nanoparticles using Homopolymers as Solid Templates: Luminescent properties of the Eu+ 3 nanoparticles products.

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Table S1. Experimental details for the synthesis of the precursors (Polymer) MCl_2 (M= Pt and Zn) and (Polymer) $Eu(NO_3)_3$

Precursor	Metalic salt	Polymer
(1a-Zn**)** **(**$P4VP(_{60000})$ **)**$ZnCl_2$	$ZnCl_2$ 1g	$P4VP_{60000}$ 0.77g
(1b-Zn) ($P4VP_{160000}$) $ZnCl_2$	$ZnCl_2$ 1g	$P4VP_{160000}$ 0.77g
(1a-Eu**) (**$P4VP_{60000}$)$Eu(NO_3)_3$	$Eu(NO_3)_3$ 1g	$P4VP_{60000}$ 0.25g
(1b-Eu) ($P4VP_{160000}$)$Eu(NO_3)_3$	$Eu(NO_3)_3$ 1g	$P4VP_{160000}$ 0.25g
(1a-Pt) ($P4VP_{60000}$)$PtCl_2$	$PtCl_2$ 1g	$P4VP_{60000}$ 0.394g
(1b-Pt) ($P4VP_{160000}$ $PtCl_2$	$PtCl_2$ 1g	$P4VP_{160000}$ 0.394g
(2a-Eu) $[N=P(O_2CH_2CF_3)]_{20}$-b-$P2VP_{20}$ $Eu(NO_3)_3$	$Eu(NO_3)_3$ 0.30g	$[N=P(O_2CH_2CF_3)]_{20}$- b-$P2VP_{20}$ O,426
(2b-Eu)($[N=P(O_2CH_2CF_3)]_{60}$-b-2VP_{20}) $Eu(NO_3)_3$	$Eu(NO_3)_3$ 0.30g	$[N=P(O_2CH_2CF_3)_{]60}$-b-P2VP20 0.395g
(2c-Eu) ($[N=P(O_2CH_2CF_3)]_{100}$- b-$P2VP_{20}$)$Eu(NO_3)_3$	$Eu(NO_3)_3$ 0.30g	$[N=P(O_2CH_2CF_3)]_{100}$-b-$P2VP_{20}$ 0.417g

[a] Solvent CH_2Cl_2, 40 ml.

Table S2. FT-IR data of polymers (P4VP, P2VP and $[N=P(O_2CH_2CF_3)_2]_n$-*b*-$[P2VP]_m$ and metallic macromolecular precursors MX_2·polymer and (MCl_2; M = Pt or Zn) and $Eu(NO_3)_3$·polymers

Precursor	**ν(Pyridine)[a]**	**ν(Pyridine) Macromolecular complex**	**Δν**
(1a)$P4VP_{60000}$	1649.9		
(1b)$P4VP_{160000}$	1650.7		
(1c)$P2VP_{37500}$	1645.8		
(2a)$[N=P(O_2CH_2CF_3)_2]_{20}$-*b*-Poli(2-vinylpyridine)$]_{20}$	1604.9		
1a-Zn		1617.9	32
1b.Zn		1617.5	33.2
1c-Zn		1618.6	27.2
1a-Eu		1638.4	11.5
1b.Eu		1637.5	13.2
1c-Eu		1627.1	18.7
1a-Pt		1598.7	51.2
1b.Pt		1617.2	33.5
1c-Pt		1597.7	48.1
2a-Eu		1599.4	5.5

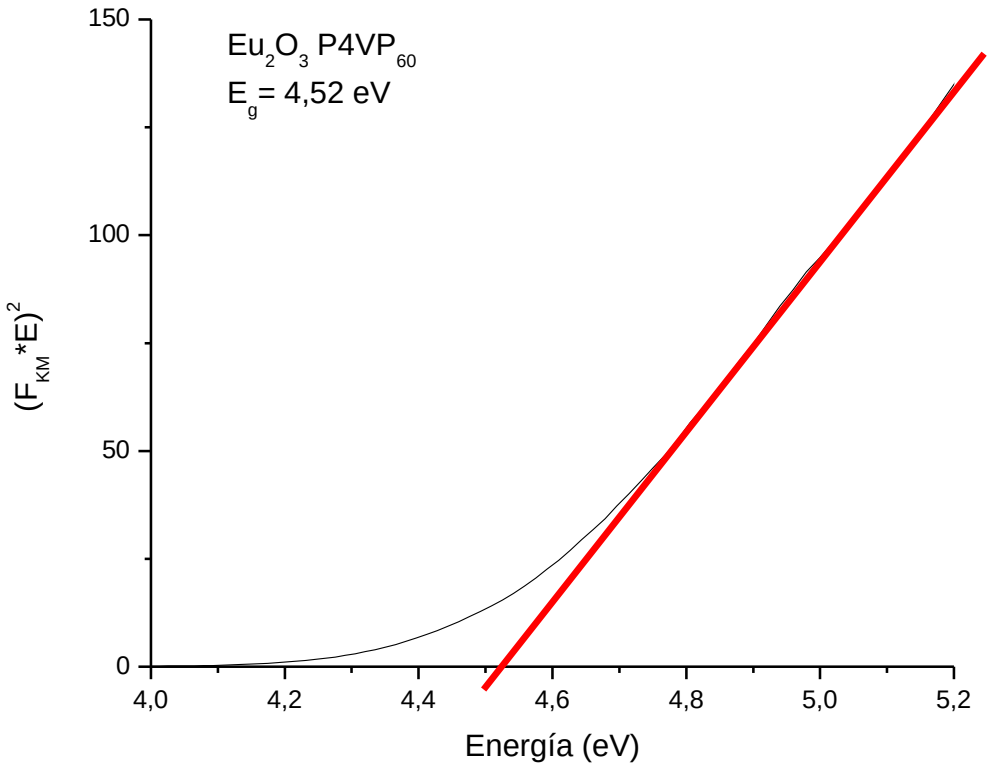
[a] ν in cm^{-1}

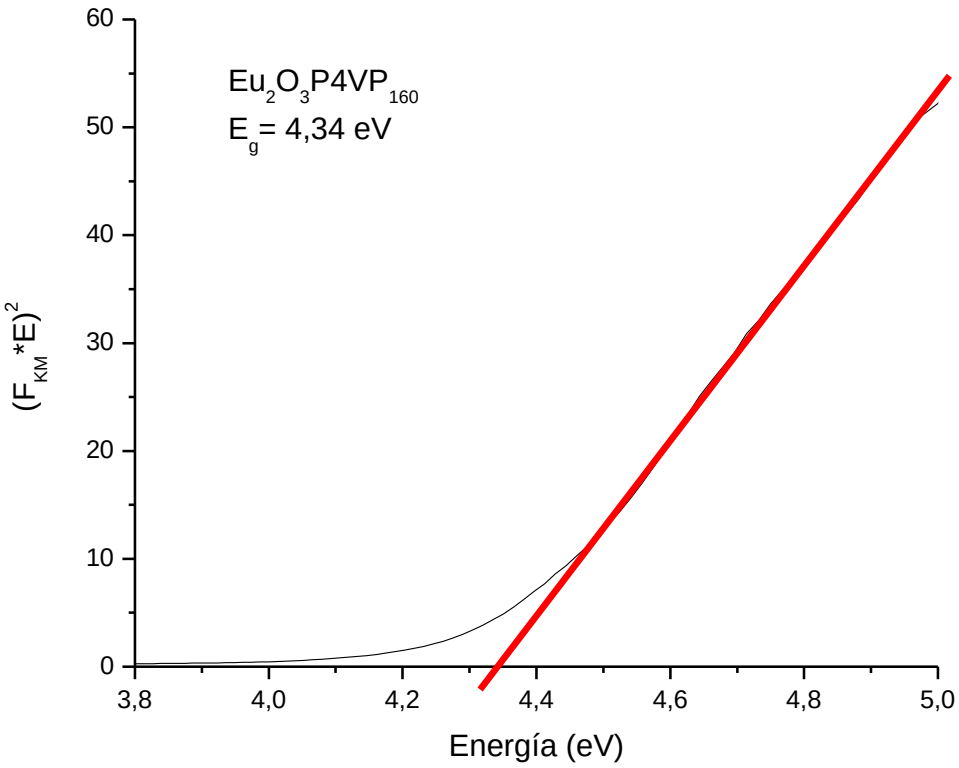
Table S3. Metal coordination degree calculated by TGA/DTA curves.

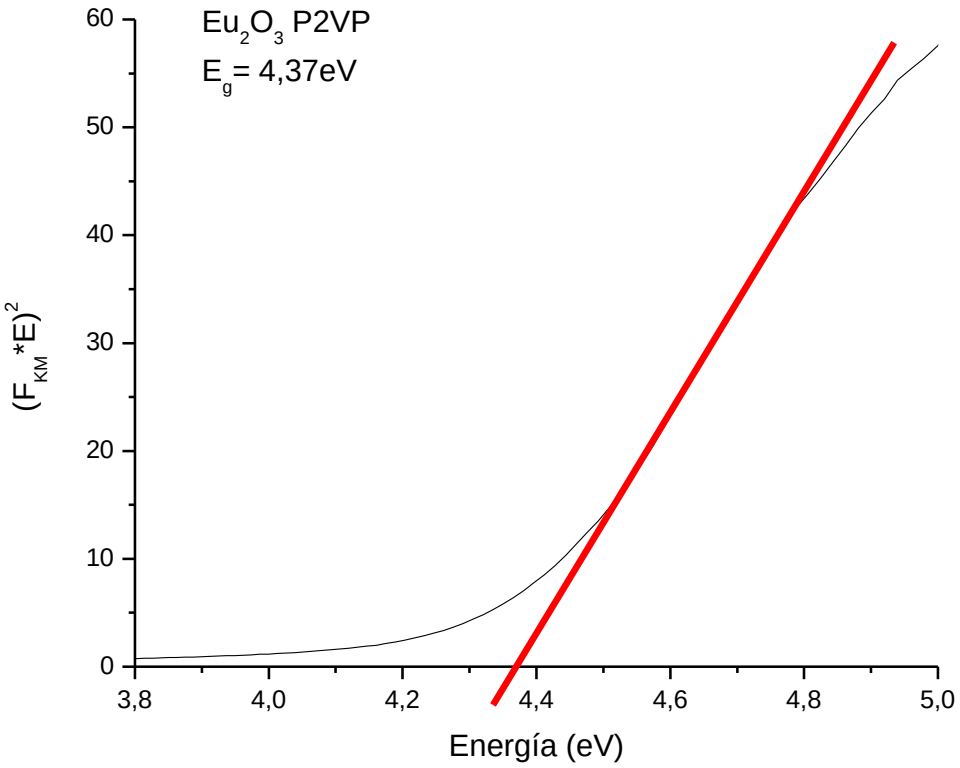
Complejo Macromolecular	**Coordination degree (%)[a]**
1a-Zn	71.78
1b.Zn	64.50
1c-Zn	47.51
1a-Eu	57.66
1b.Eu	55.27
1c-Eu	57.72
1a-Pt	99.60
1b.Pt	100
1c-Pt	100
2a-Eu	54.6
2b-Eu	53.5
2c-Eu	50.4

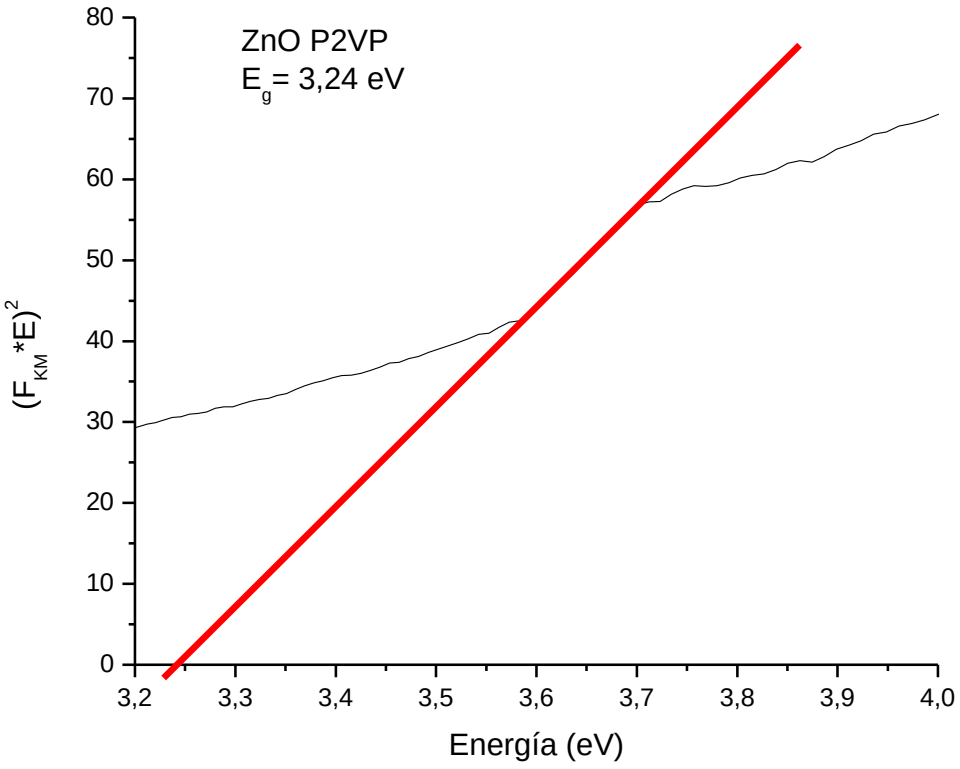
[a] estimated from TGA analisis

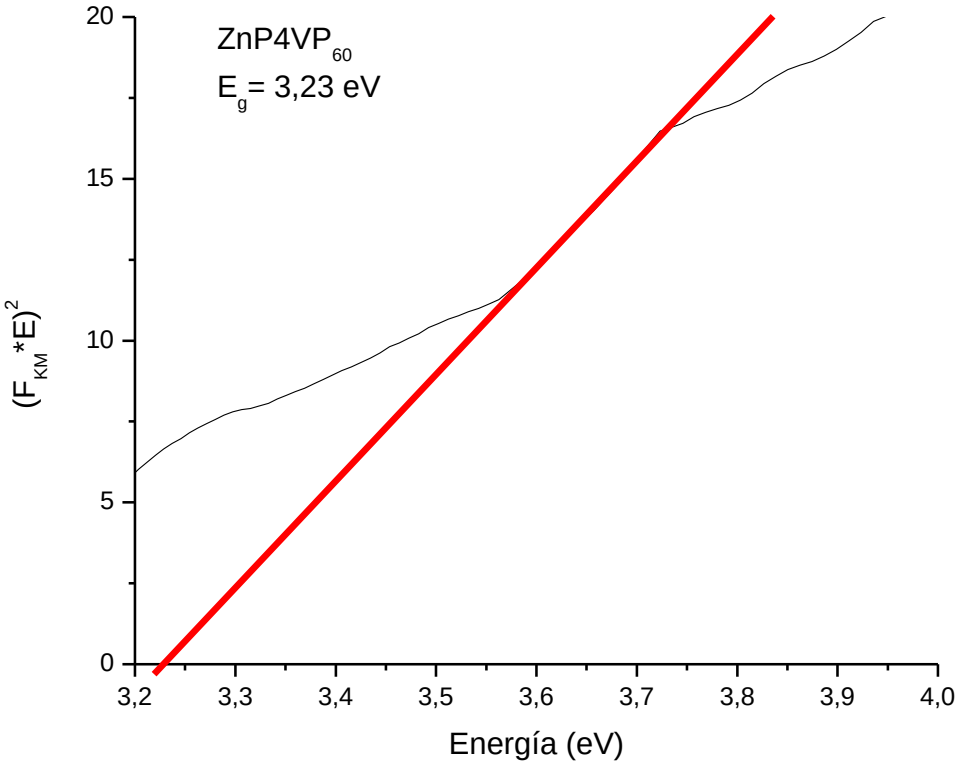
Figure S1. Band Gap values for ZnO and Eu_2O_3 calculated by using the Tauc plots. Nanostructured oxides were prepared by pyrolysis of the precursores 1a -Eu , 1b.Eu, 1c-Eu and 1a -Zn, 1b.Zn, 1c-Zn




Eu2O3P4VP160
Eg= 4,34 eV
(FKM*E)2
60
50
40
30
20
10
0
3,8
4,0
4,2
4,4
4,6
4,8
5,0
Energía (eV)


Eu2O3 P2VP
Eg= 4,37eV
(FKM*E)2
60
50
40
30
20
10
0
3,8
4,0
4,2
4,4
4,6
4,8
5,0
Energía (eV)


ZnO P2VP
E_g= 3,24 eV
$(F_{KM}*E)^2$
Energía (eV)
0
10
20
30
40
50
60
70
80
3,2
3,3
3,4
3,5
3,6
3,7
3,8
3,9
4,0


ZnP4VP60
Eg= 3,23 eV
(FKM*E)2
Energía (eV)
0
5
10
15
20
3,2
3,3
3,4
3,5
3,6
3,7
3,8
3,9
4,0

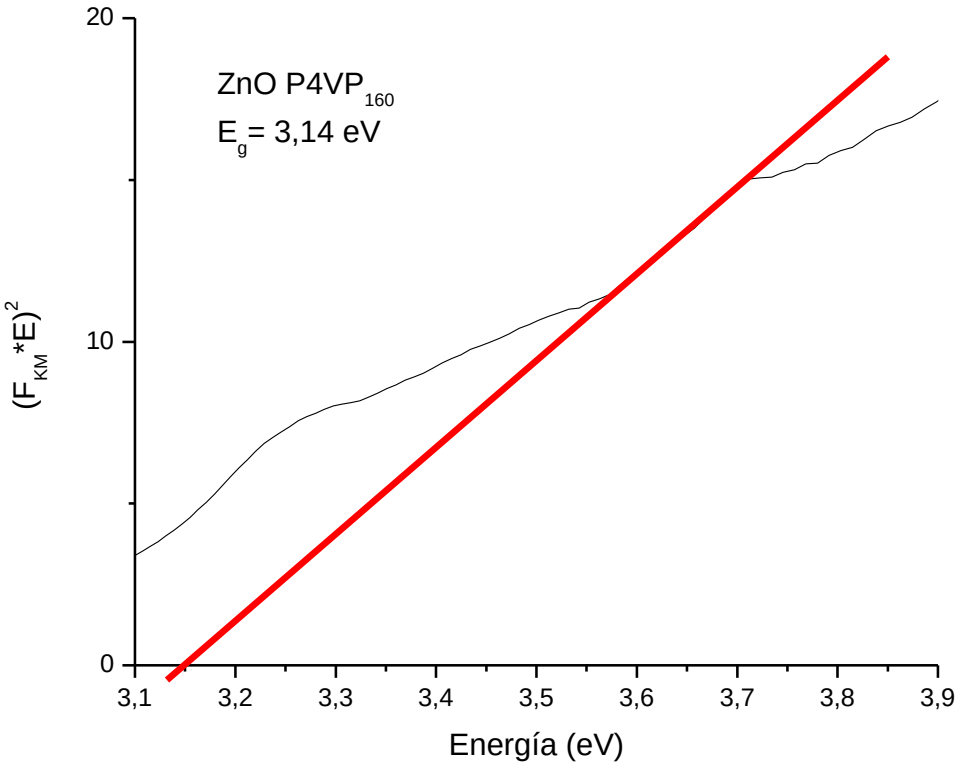

ZnO P4VP160
Eg= 3,14 eV
(FKM*E)2
20
10
0
3,1
3,2
3,3
3,4
3,5
3,6
3,7
3,8
3,9
Energía (eV)

Table S4. Band gap values for ZnO and Eu_2O_3 materials prepared by pyrolysis of the precursors 1a -Zn, 1b.Zn, 1c-Zn and 1a -Eu, 1b.Eu, 1c-Eu

Macromolecular Precursor	**M_w**	**Fórmula**	**E_g (eV)**
1a-Zn	**60000**	**ZnO**	**3,23**
1b.Zn	**160000**	**ZnO**	**3.14**
1c-Zn	**37500**	**ZnO**	**4.24**
1a-Eu	**60000**	**Eu_2O_3**	**4.52**
1b.Eu	**160000**	**Eu_2O_3**	**4.34**
1c-Eu	**37500**	**Eu_2O_3**	**4.37**

Table S5. X-Ray Assignment for Eu_2O_3

Caption	Angle	d value	Intensity	Intensity %	h	k	l
	2-Theta °	Angstrom	Count	%			
d=5,12985	17,272	5,12985	106	11,5	1	1	0
d=4,10442	21,634	4,10442	308	33,3	1	0	1
d=2,96921	30,072	2,96921	470	50,8	2	0	0
d=2,90338	30,771	2,90338	231	24,9	0	0	2
d=2,81278	31,788	2,81278	899	97,1	1	2	0
d=1,92363	47,212	1,92363	481	52,0	-2	2	1
d=1,89604	47,941	1,89604	69,4	7,5	-3	1	1
d=1,65985	55,301	1,65985	315	34,0	-0	4	1
d=1,30799	72,161	1,30799	203	21,9	-5	2	2

Figure S2: Mechanism Formation

Schematic representation of the proposed mechanism of formation of the metal oxide nanoparticles. MXn represents the general formula of the metallic salt coordinated to the poly(4-vinylpyridine), poly(2-vinylpyridine) and $[N=P(O_2CH_2CF_3)]_m$-*b*-P2VP$_{20}$ polymers, }}}}}}} represents the respective polymer. $EuPO_4$ or Pt° represents the respective formed inside the graphite matrix. The given temperatures are referential general.