Electronic Supplementary Material (ESI) for RSC Advances.

Design of Oxygen Sensing Nanomaterial: Synthesis, Encapsulation of Phenylacetylide Substituted Pd(II) and Pt(II) *meso*-tetraphenylporphyrins into Poly(1-trimethylsilyl-1-propyne) Nanofibers and Influence of Silver Nanoparticles

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Electronic Supplementary Information

Table S1: Microwave promoted Pd(II) metal insertion to **H_2-TPPBr**.

Entry	Metal salt	Organic solvent	Conditions	% yield	Procedure according to Ref
1	2 equiv.$PdCl_2$	PhCN	191 ^oC, Reflux, 1 day	68	[26]
2	2.5 equiv.$PdCl_2$	Acetic acid	Rt. 30 min.	10	[34]
3	2.5 equiv. Pd(II)acetate	Acetic acid	Rt. 30 min.	5	[34]
4	3 equiv. Pd(II)acetate	Chloroform-Methanol	Reflux, 45 min.	24	[35]
5	3 equiv. $Pd(acac)_2$	Pyridine	180^{o}C, Reflux, 1 day	49	[29]
6	3 equiv. $Pd(acac)_2$	Pyridine	180^{o}C, MW, 15 min.	-	[29]
7	3 equiv. $Pd(acac)_2$	NMP	180 ^{o}C, MW, 15 min.	81	

Table S2: Microwave promoted Pt(II) metal insertion to **H_2-TPPBr**.

Entry	Metal salt	Organic solvent	Conditions	% yield	Procedure according to Ref
1	3 equiv.$PtCl_2$	PhCN	191 ^{o}C, Reflux, 1 day	-	[26]
2	3 equiv.$Pt(acac)_2$	PhCN	191 ^{o}C, Reflux, 1 day	23	[36]
3	3 equiv.$Pt(acac)_2$	PhCN	191 ^{o}C, MW, 45 min.	-	[29]
4	3 equiv.$Pt(acac)_2$	Chloroform-Methanol	70 ^{o}C, Reflux, 1 day	-	[35]
5	3 equiv.K_2PtCl_4	NMP	100 ^{o}C, MW, 50 min.	-	
6	3 equiv.$Pt(acac)_2$	NMP	110^{o}C, MW, 45 min.	25	

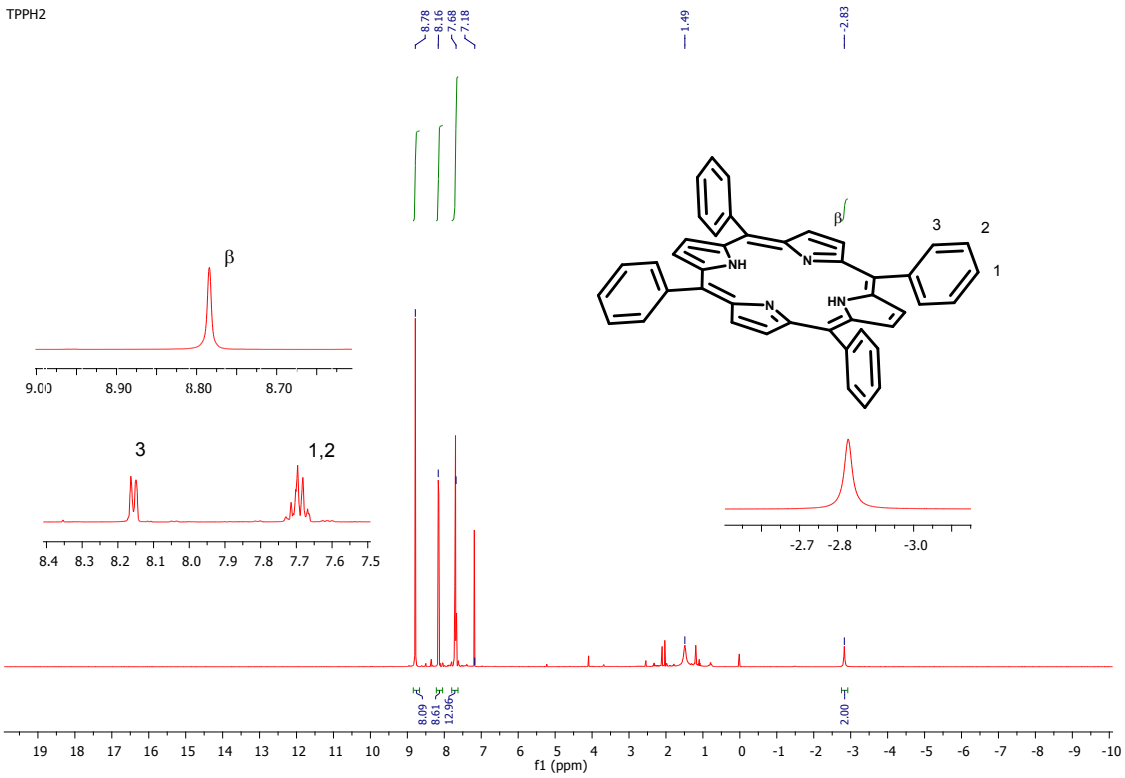

Figure S1.[1]H NMR spectrum of *meso*-tetraphenylporphyrin **(H_2-TPP)**

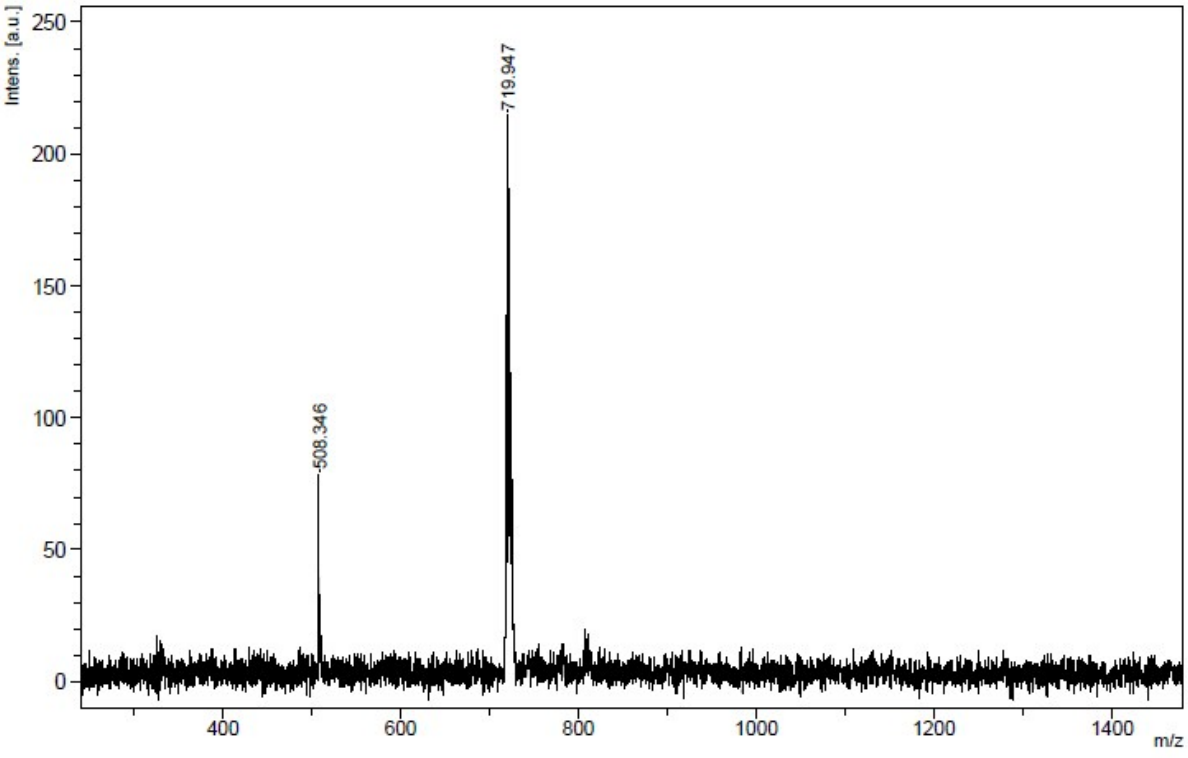

Figure S2.MALDI-MS spectrum of *meso*-tetraphenylporphyrinato palladium **(Pd-TPP)**

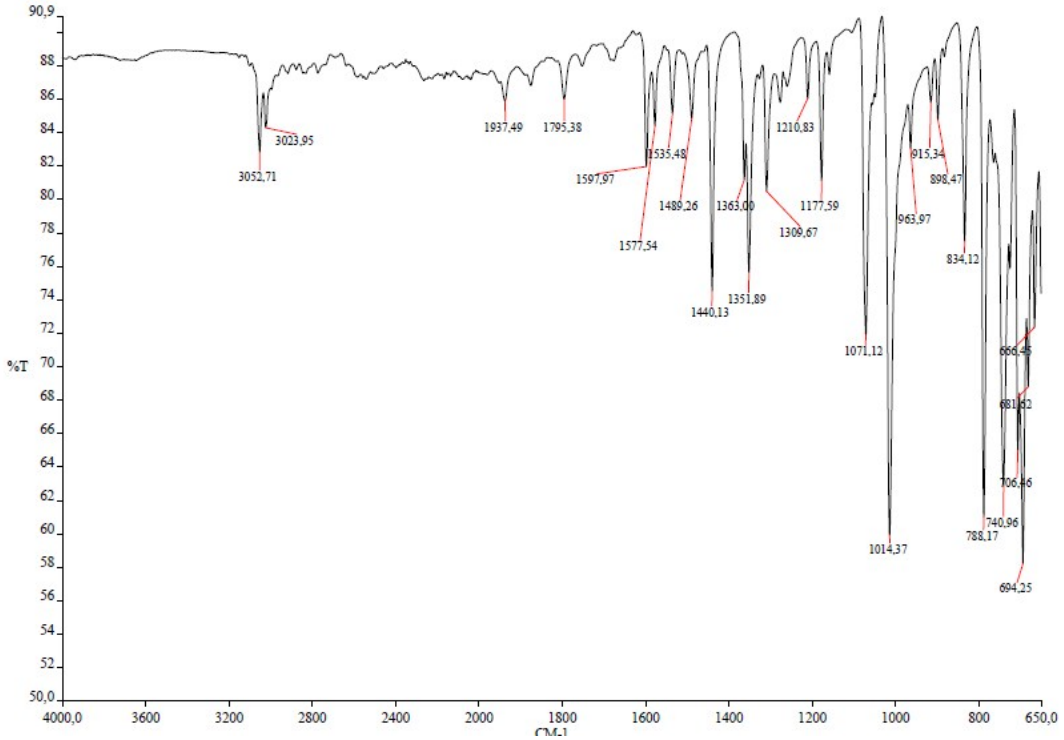

Figure S3.FT-IR spectrum of *meso*-tetraphenylporphyrinato palladium **(Pd-TPP)**

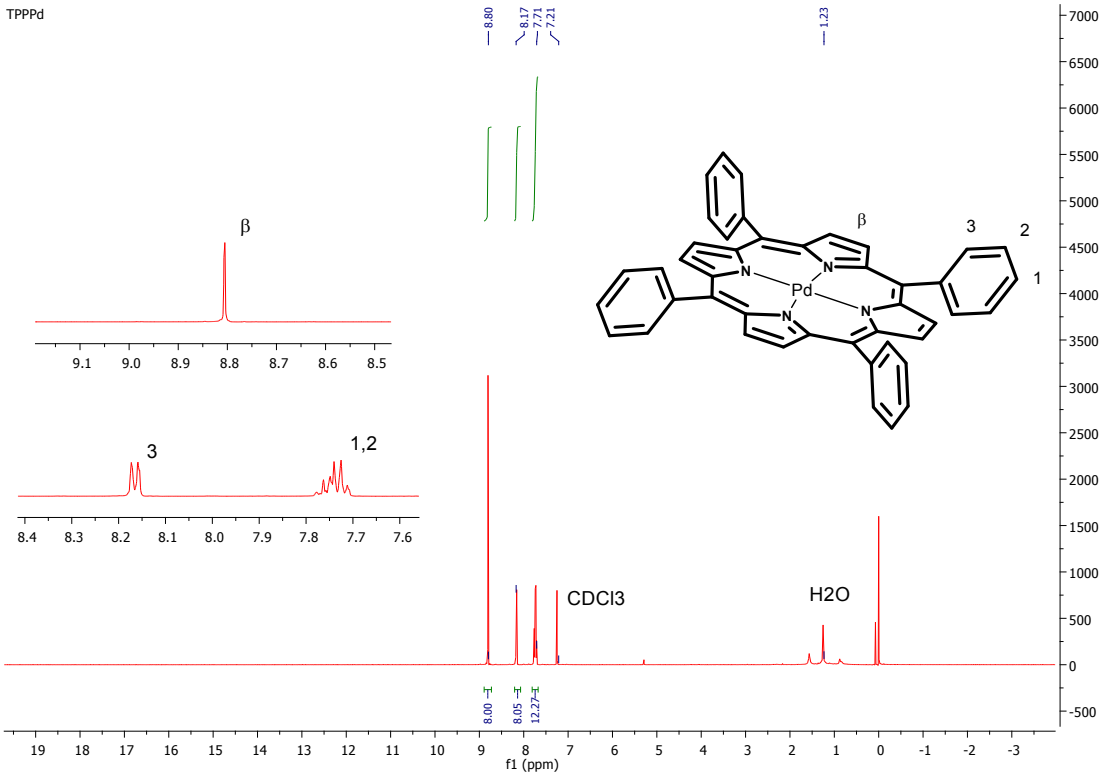

Figure S4.^{1}H NMR spectrum of *meso*-tetraphenylporphyrinato palladium **(Pd-TPP)**

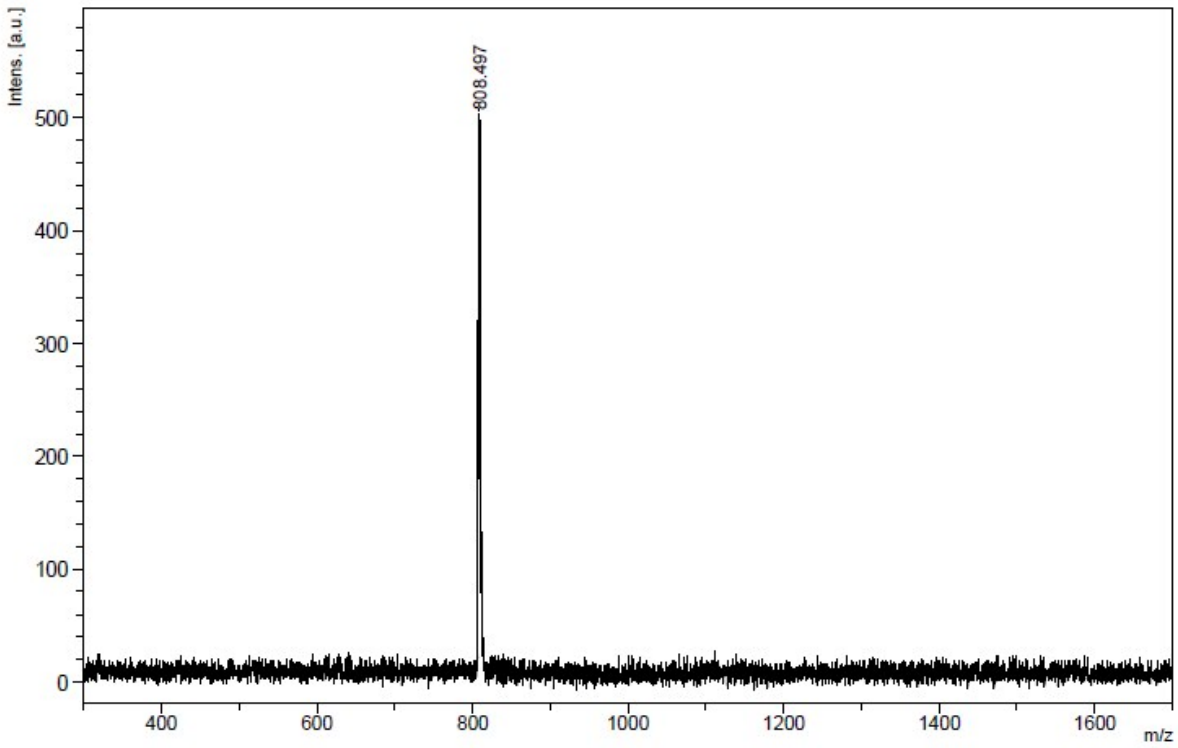

Figure S5.MALDI-MS spectrum of *meso*-tetraphenylporphyrinato platinum **(Pt-TPP)**

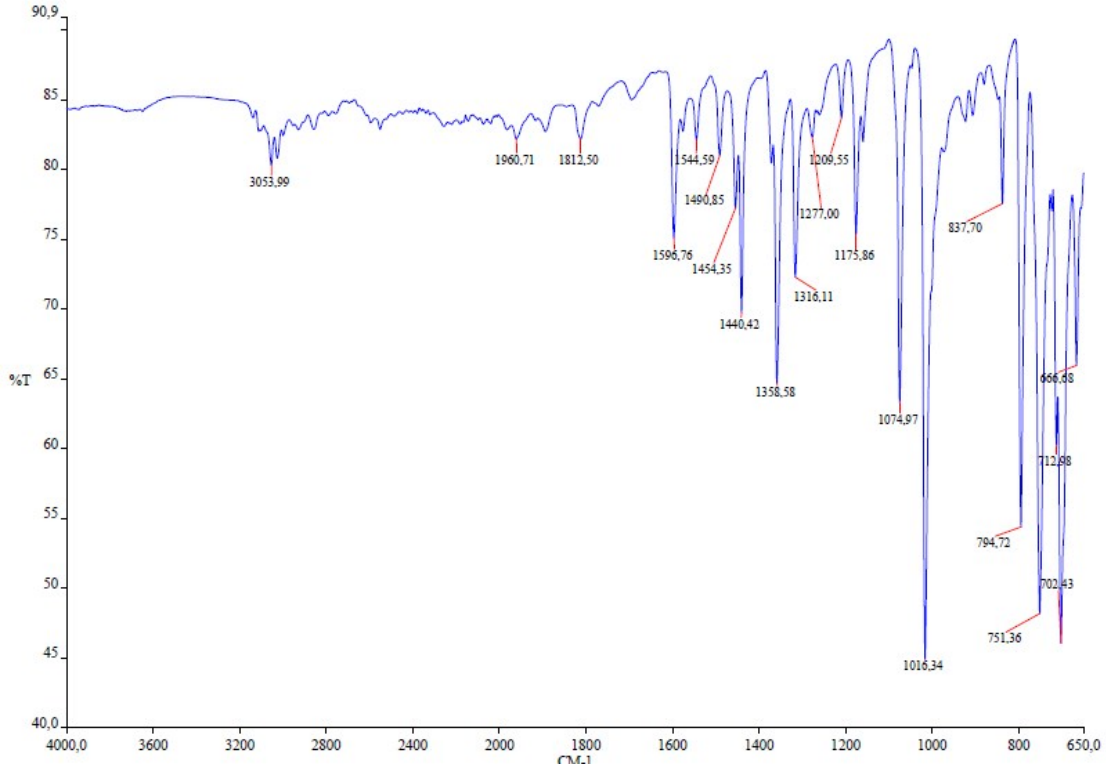

Figure S6.FT-IR spectrum of *meso*-tetraphenylporphyrinato platinum **(Pt-TPP)**

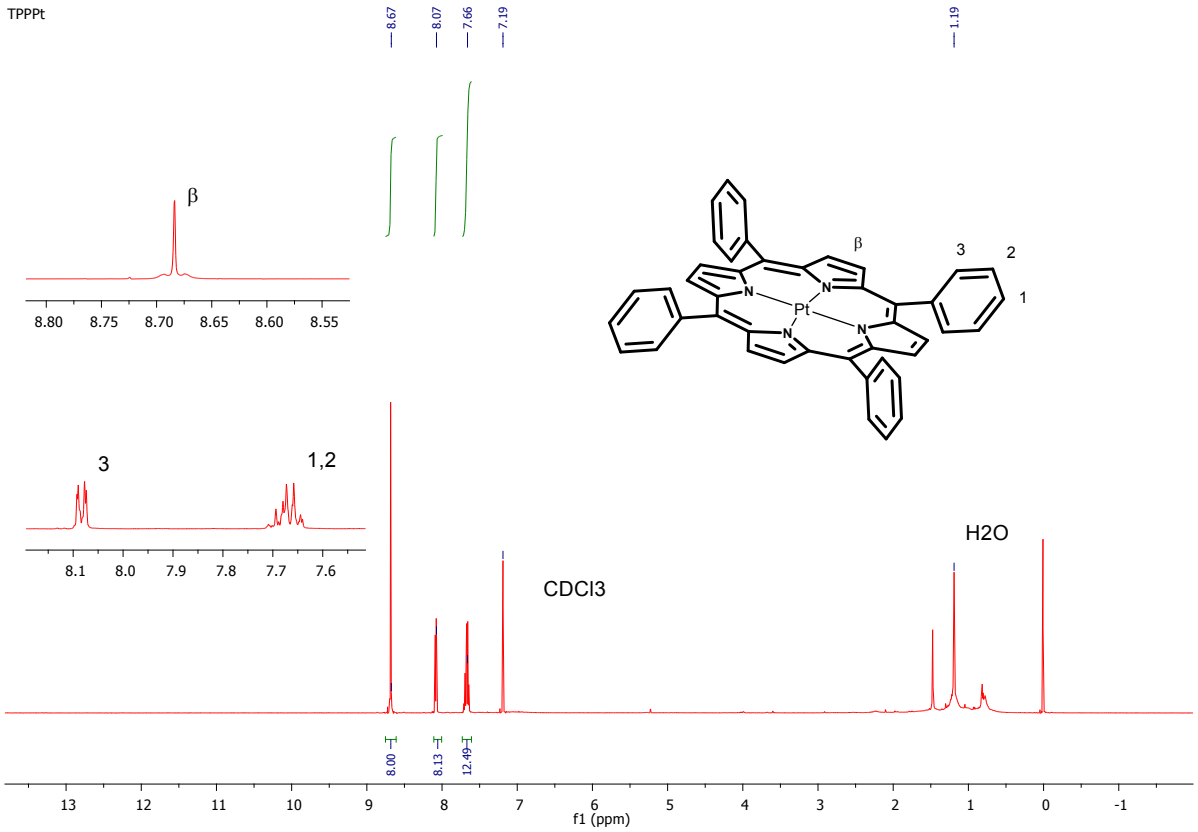

Figure S7. ^{1}H NMR spectrum of *meso*-tetraphenylporphyrinato platinum **(Pt-TPP)**

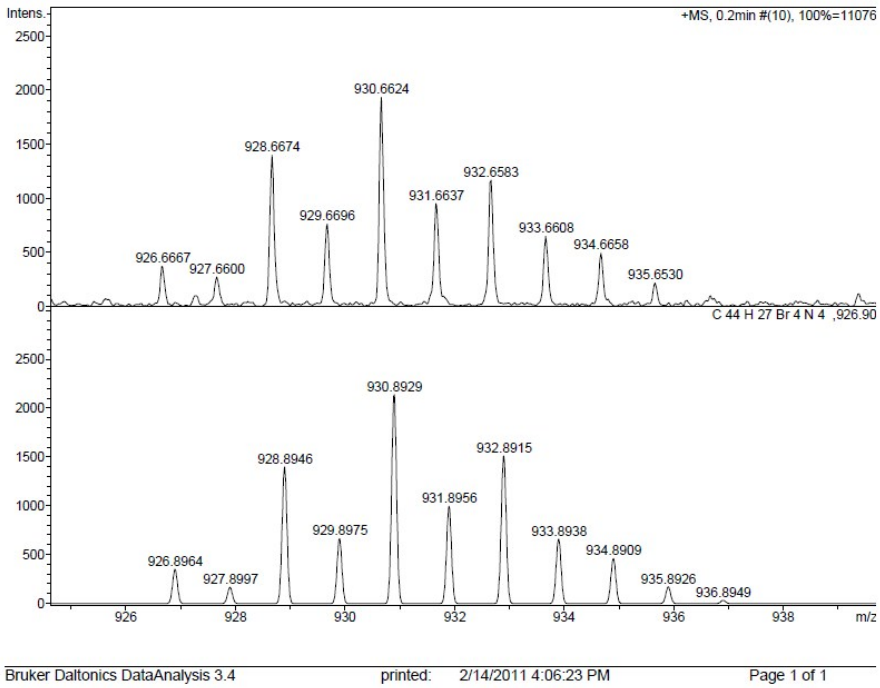

Figure S8.ESI-MS spectrum of *meso*-tetrakis(4-bromophenyl)porphyrin **(H_2-TPPBr)**

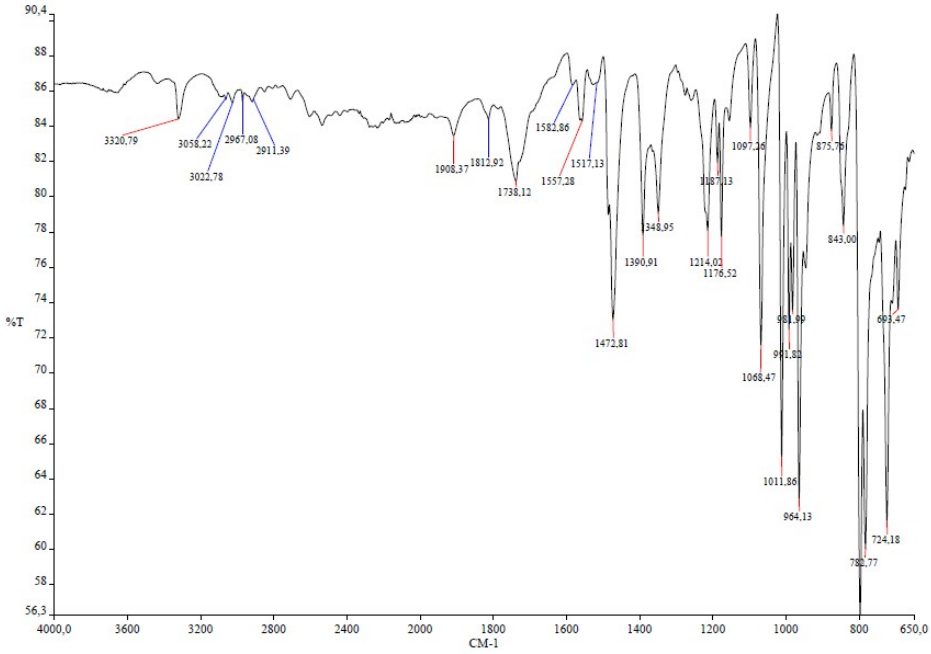

Figure S9.FT-IR spectrum of *meso*-tetrakis(4-bromophenyl)porphyrin **(H_2-TPPBr)**

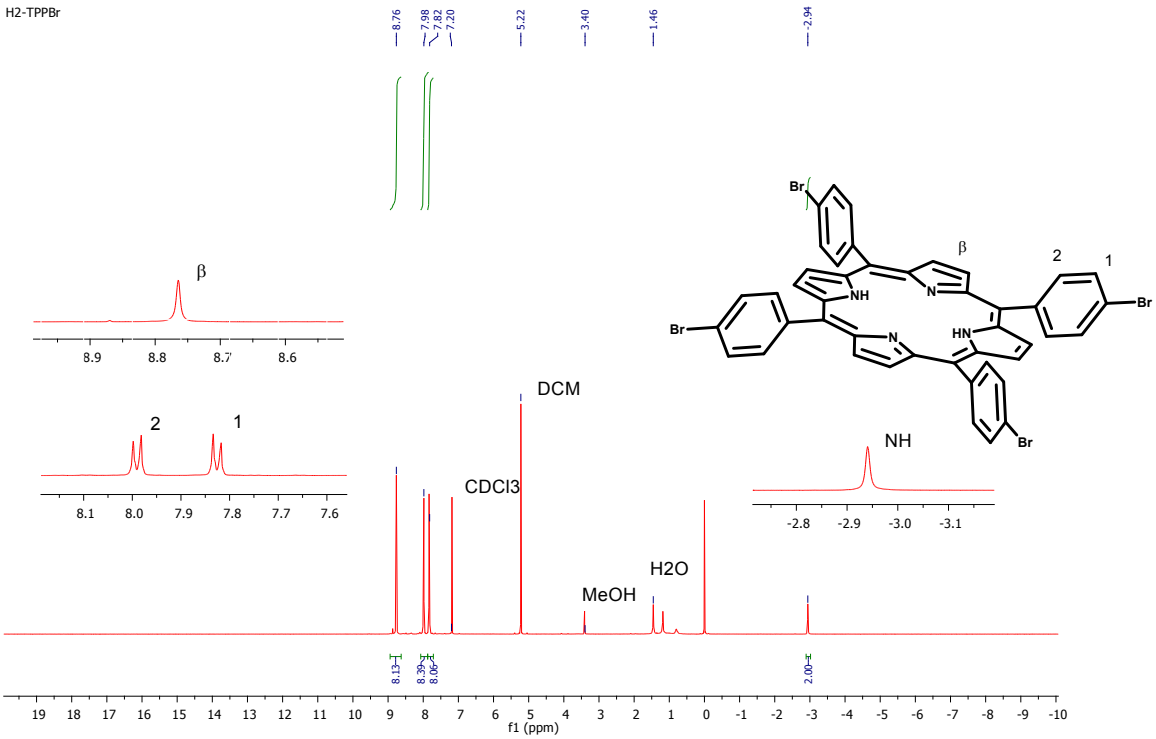

Figure S10.[1]H NMR spectrum of *meso*-tetrakis(4-bromophenyl)porphyrin **(H_2-TPPBr)**in $CDCl_3$.

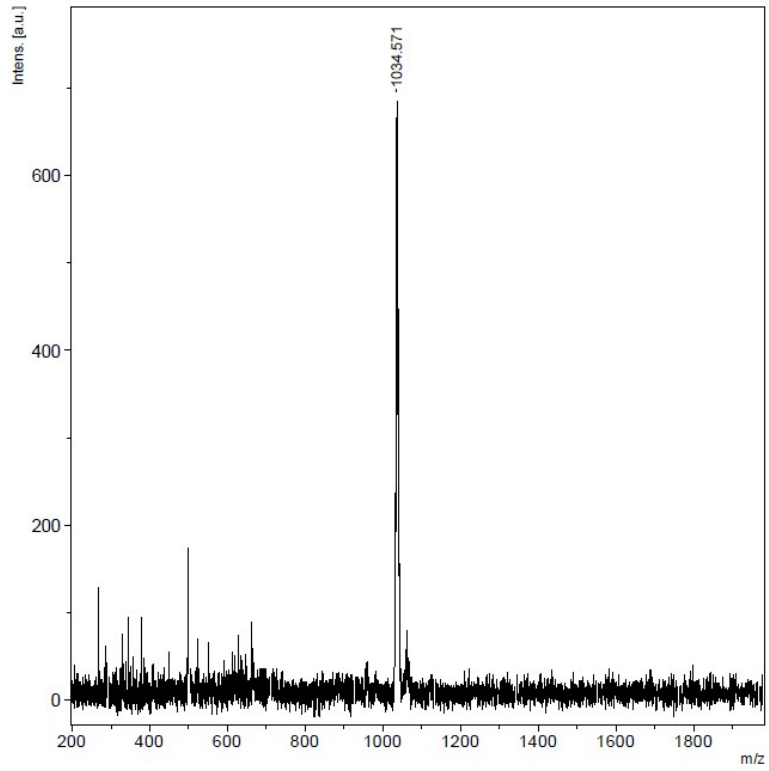

Figure S11.MALDI-MS spectrum of *meso*-tetrakis(4-bromophenyl)porphyrinato Palladium(II) **(Pd-TPPBr)**

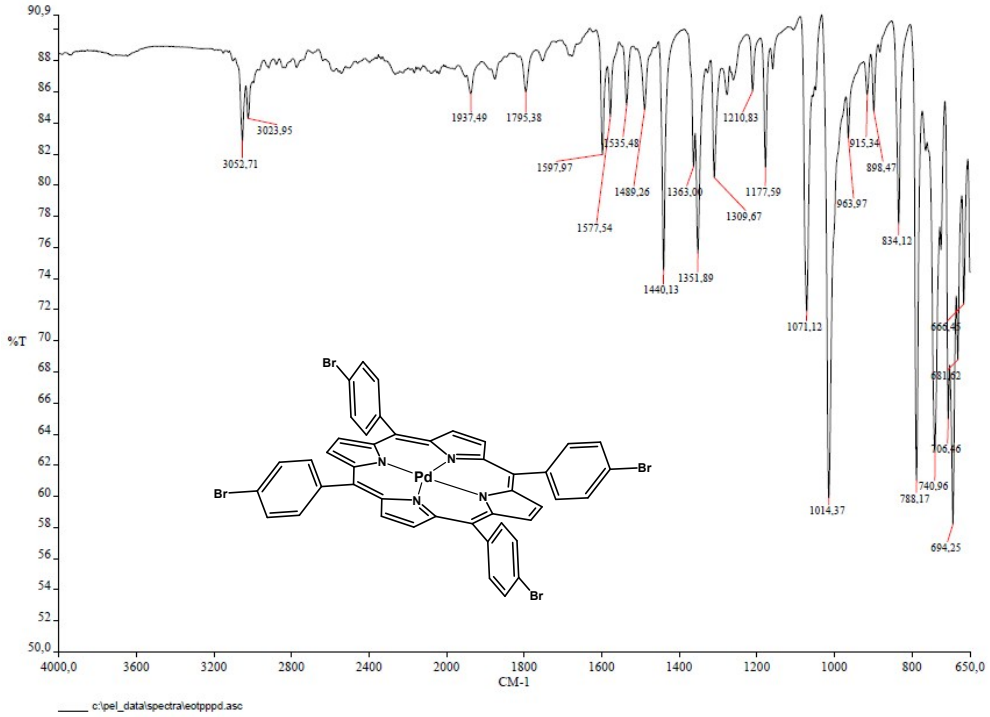

Figure S12.FT-IR spectrum of *meso*-tetrakis(4-bromophenyl)porphyrinato Palladium(II) **(Pd-TPPBr)**

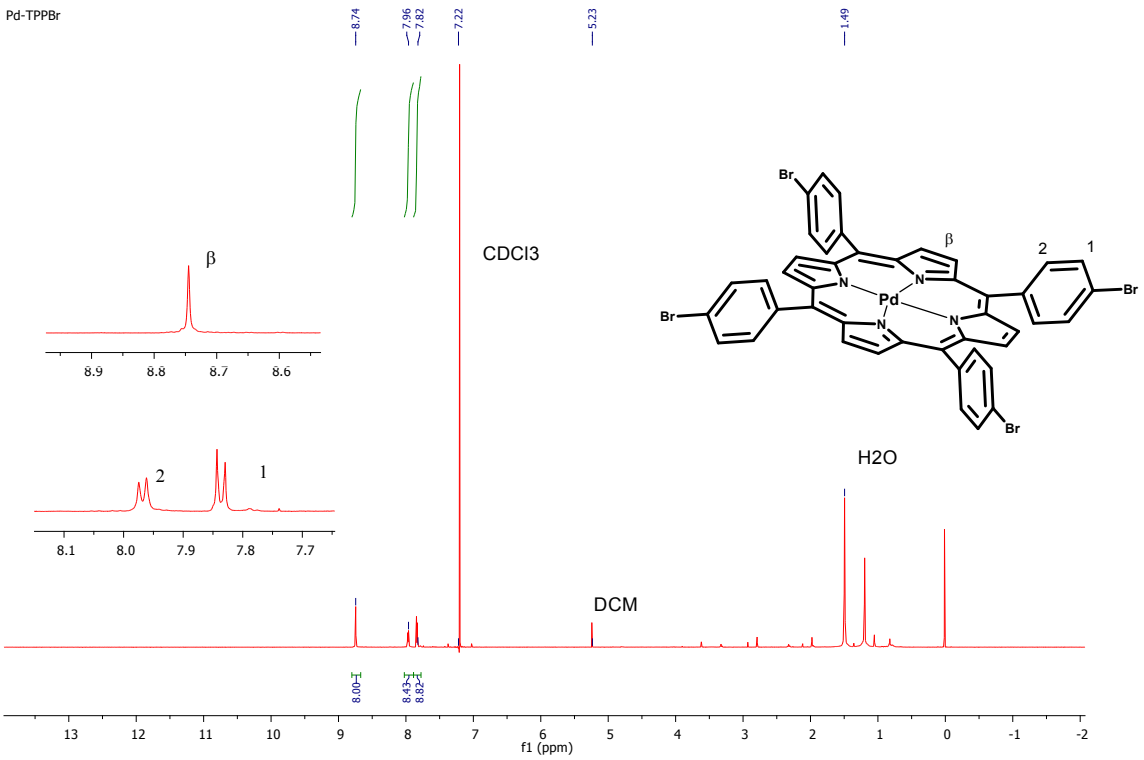

Figure S13.[1]H NMR spectrum of *meso*-tetrakis(4-bromophenyl)porphyrinato Palladium(II) **(Pd-TPPBr)**

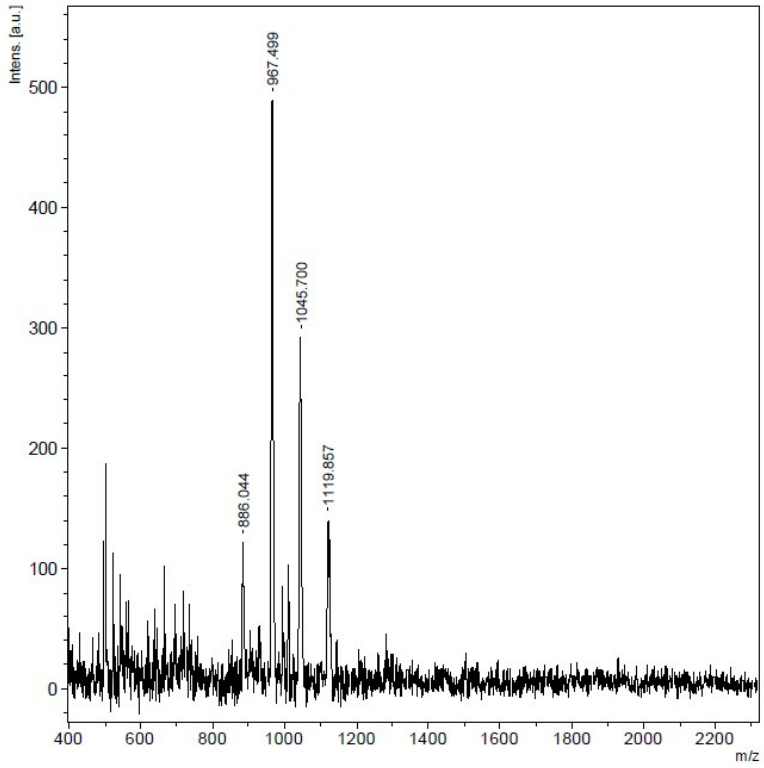

Figure S14.MALDI-MS spectrum of *meso*-tetrakis(4-bromophenyl)porphyrinato Platinum(II) **(Pt-TPPBr)**

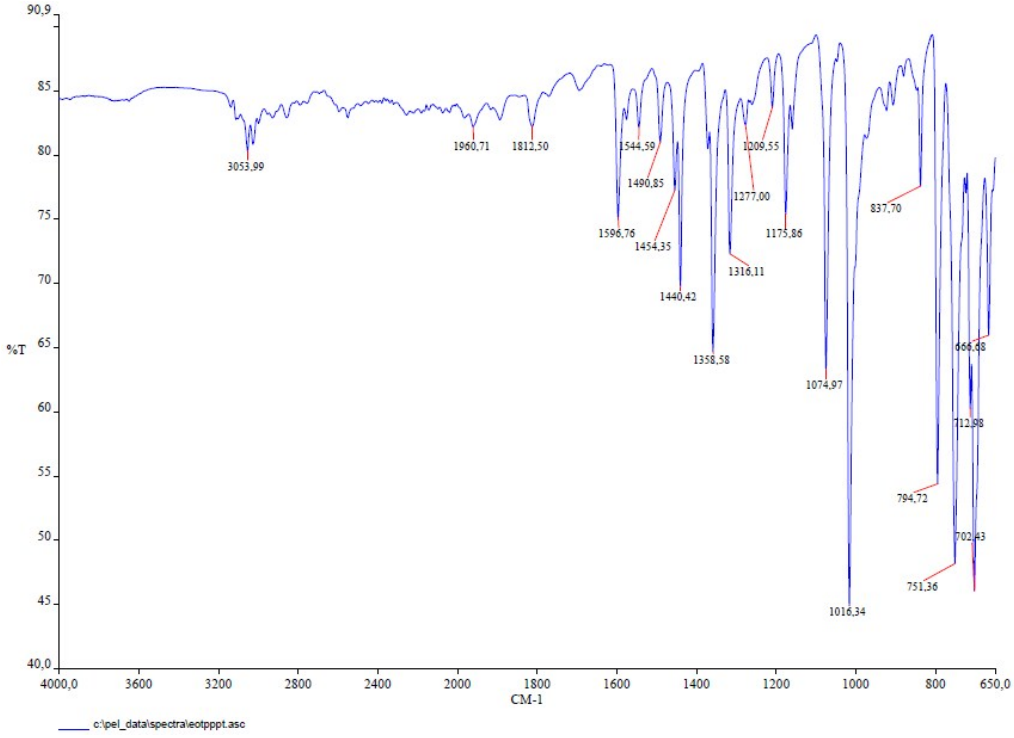

Figure S15.FT-IR spectrum of *meso*-tetrakis(4-bromophenyl)porphyrinato Platinum(II) **(Pt-TPPBr)**

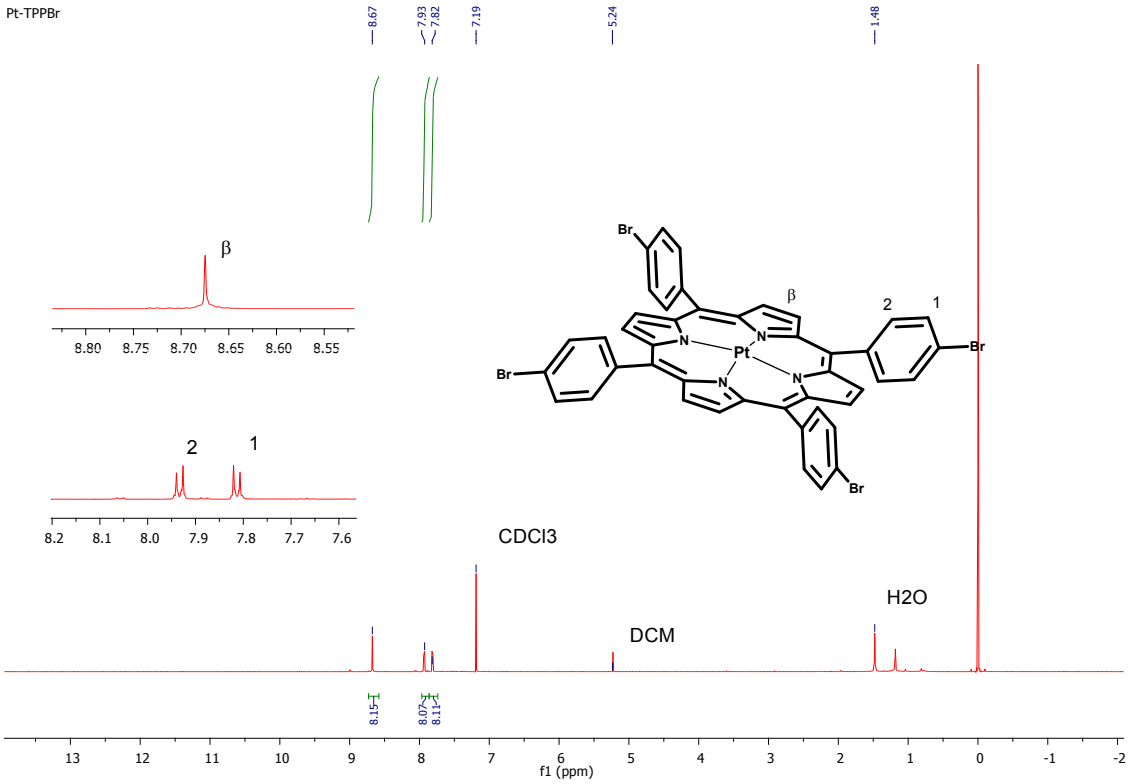

Figure S16.[1]H NMR spectrum of *meso*-tetrakis(4-bromophenyl)porphyrinato Platinum(II) **(Pt-TPPBr)**

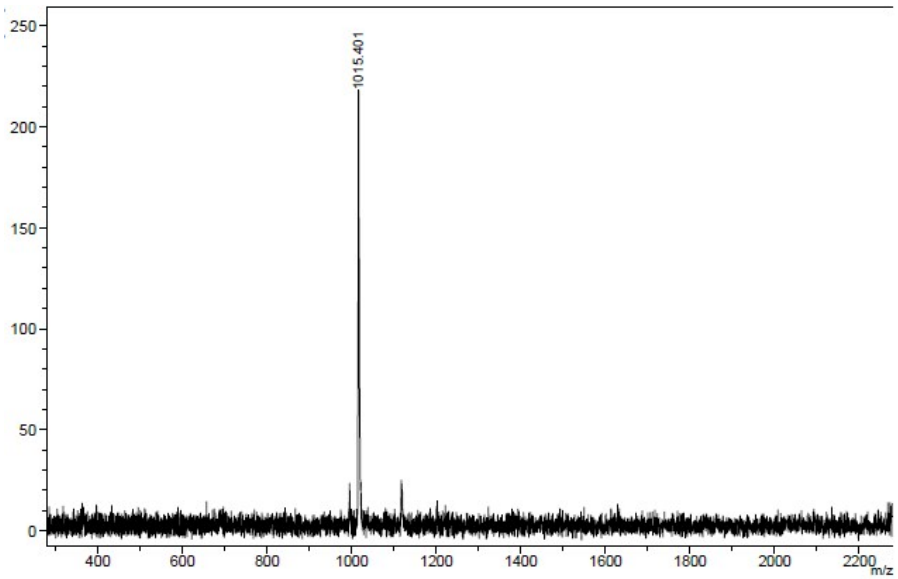

Figure S17.MALDI-MS spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrin **(H_2-TPA)**

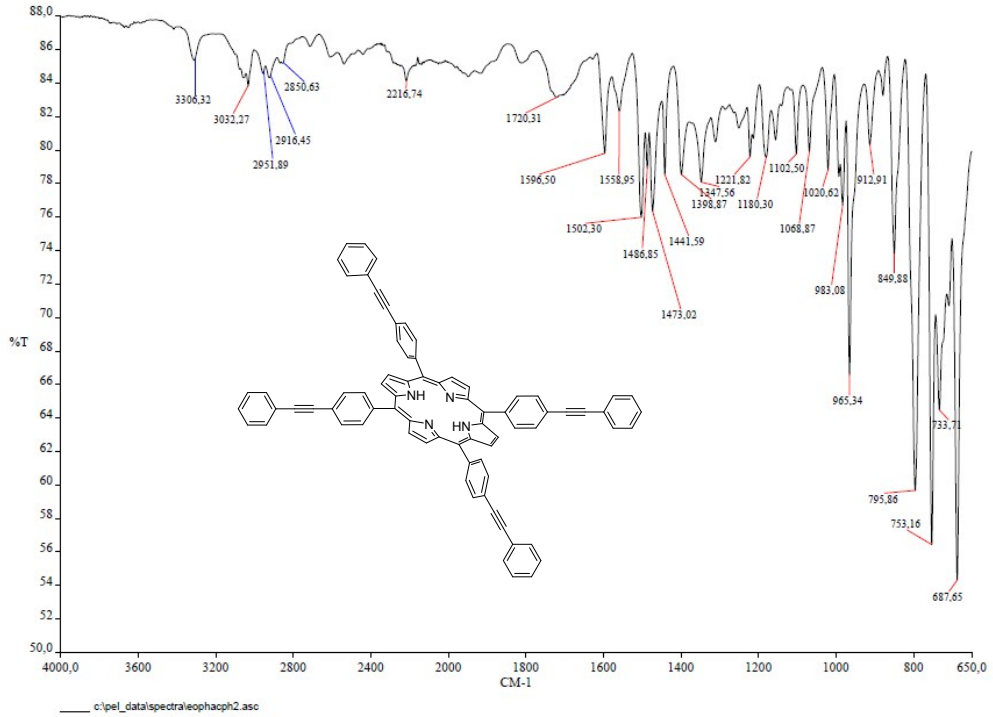

Figure S18.FT-IR spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrin **(H_2-TPA)**

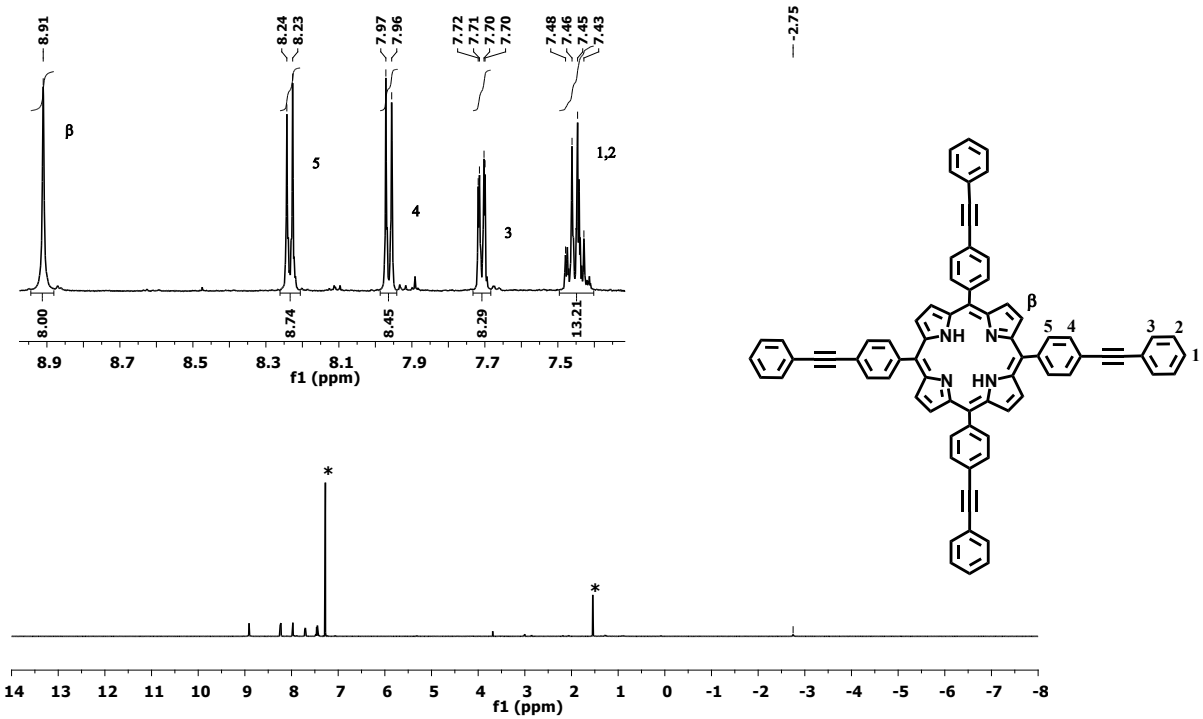

Figure S19.^{1}H NMR spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrin **(H_2-TPA)**in $CDCl_3$.

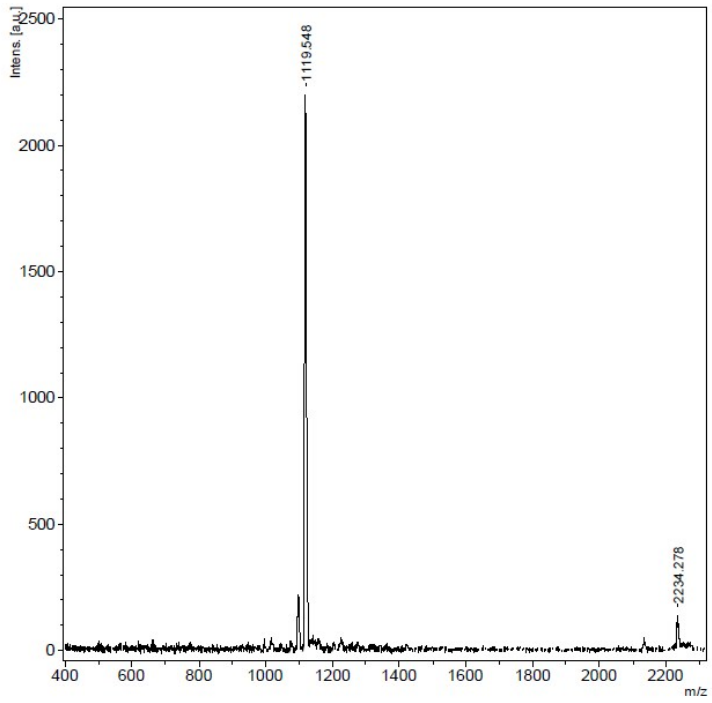

Figure S20.MALDI-MS spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrinato Palladium(II) **(Pd-TPA)**.

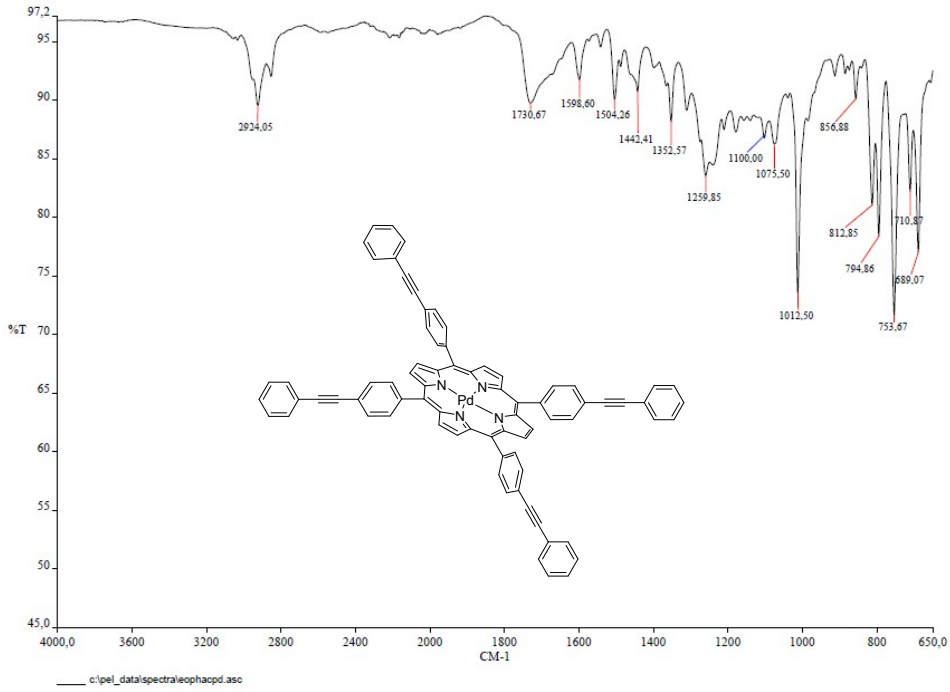

Figure S21.FT-IR spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrinato Palladium(II) **(Pd-TPA)**.

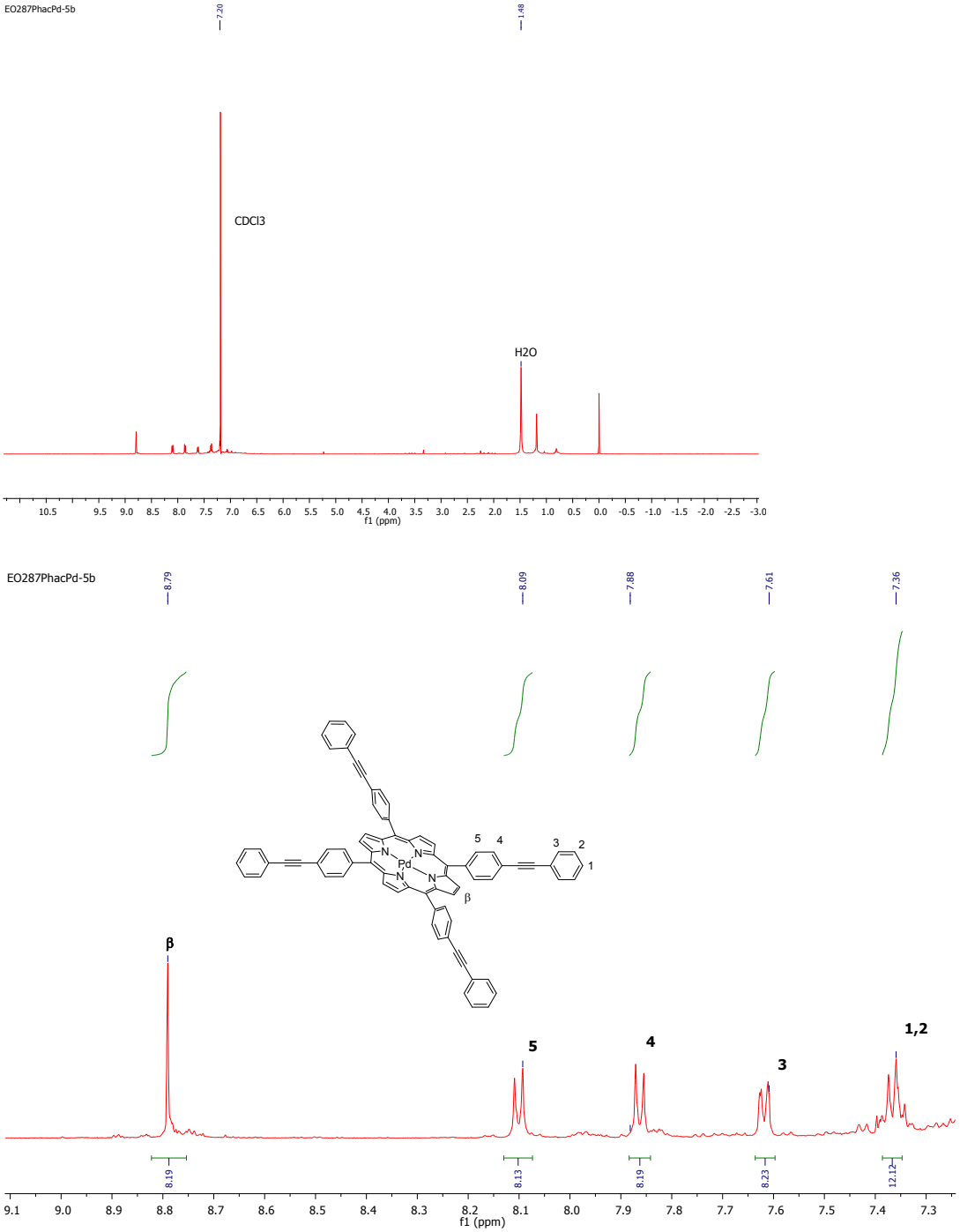

Figure S22.[1]H NMR spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrinato Palladium(II) **(Pd-TPA)**in $CDCl_3$.

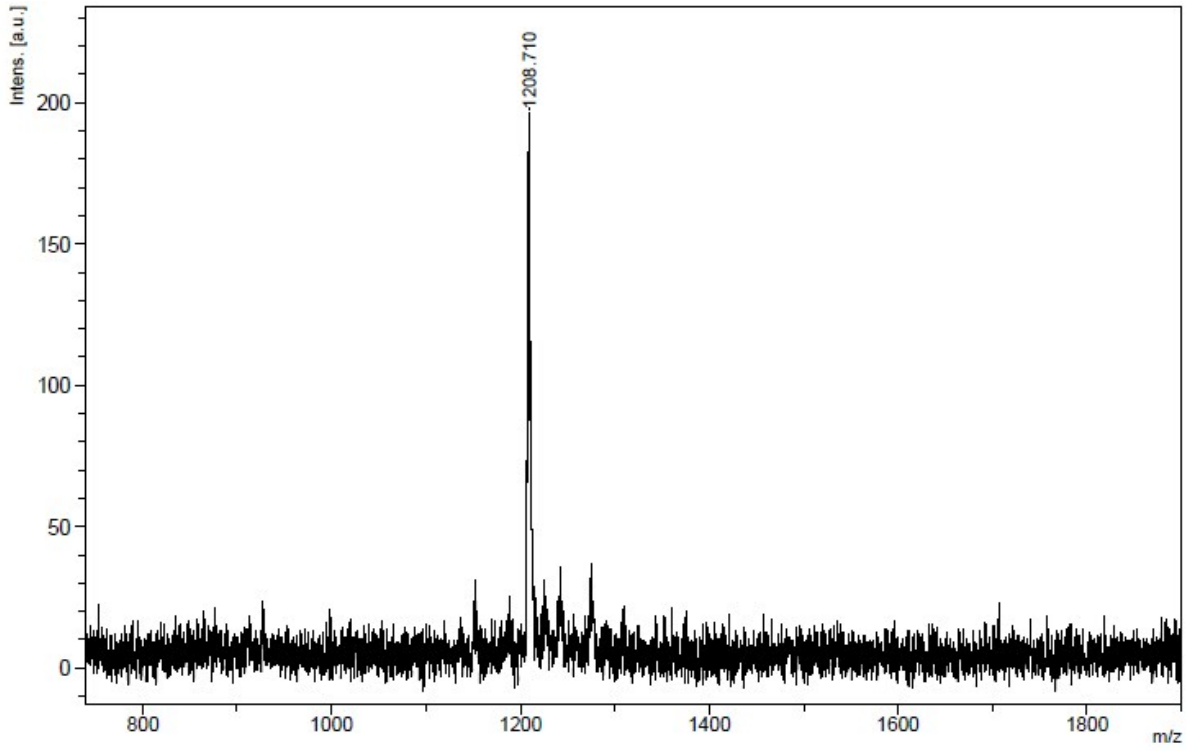

Figure S23.MALDI-MS spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrinato Platinum(II) **(Pt-TPA)**.

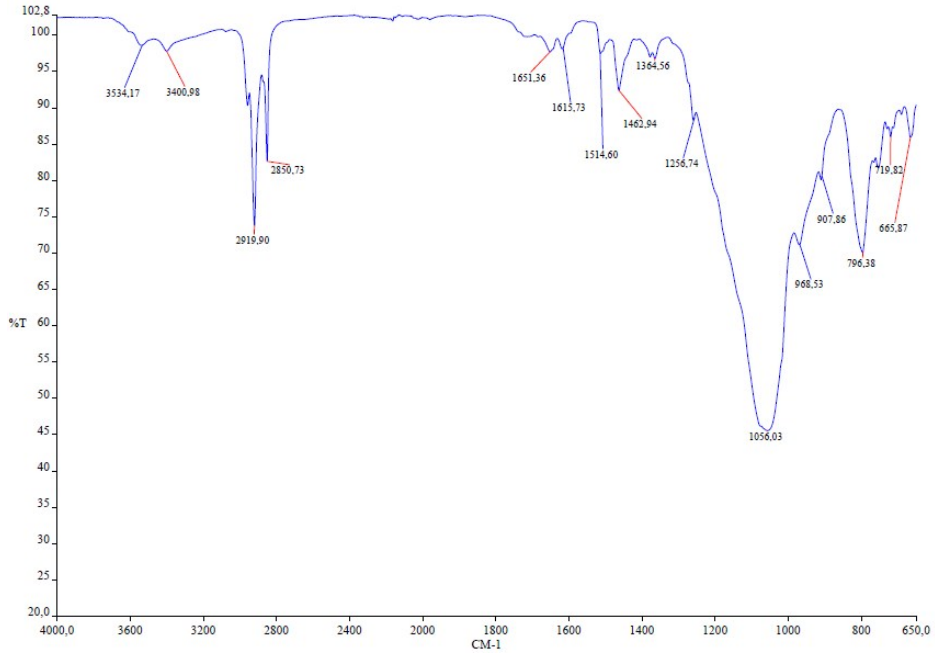

Figure S24.FT-IR spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrinato Platinum(II) **(Pt-TPA)**.

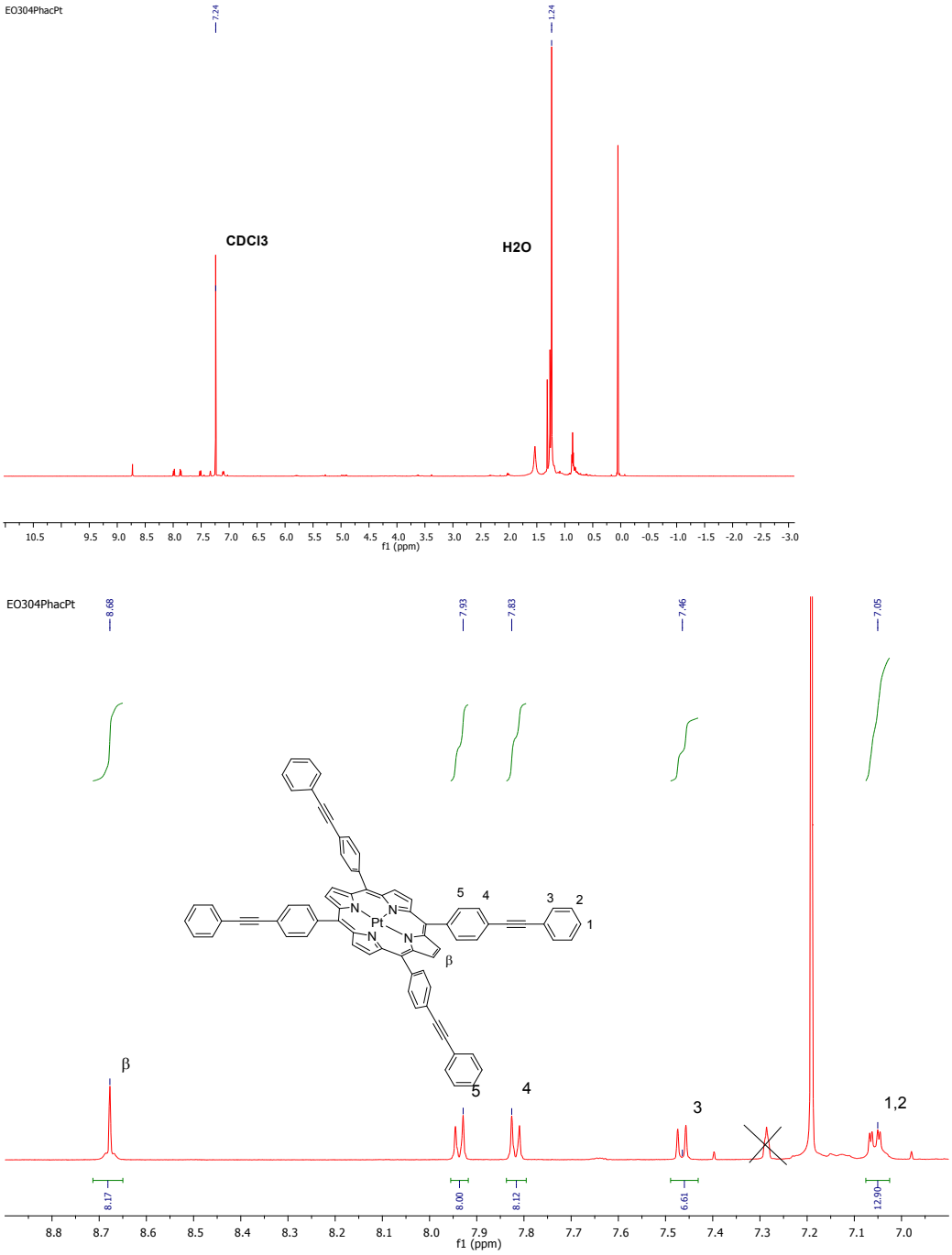

Figure S25.[1]H NMR spectrum of *meso*-tetrakis(4-phenylethynyl)phenylporphyrinato Platinum(II) **(Pt-TPA)**in $CDCl_3$.

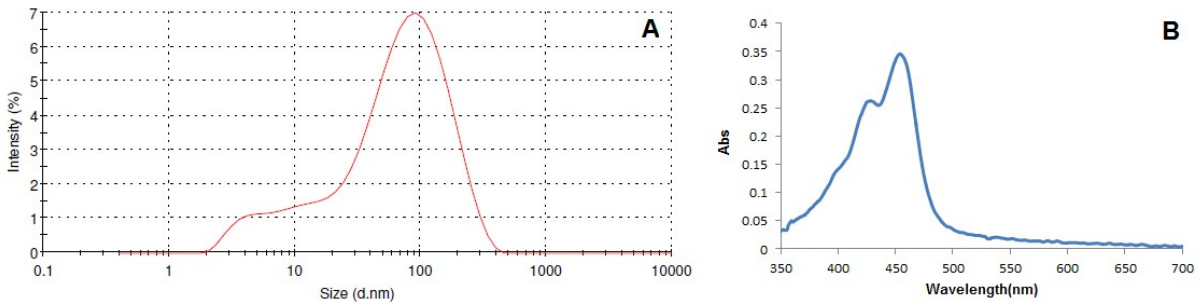

Figure S26: Characterization of silver nanoparticles (**AgNPs**): A) Size distributionanalysis, and B) UV-Vis spectra in THF.

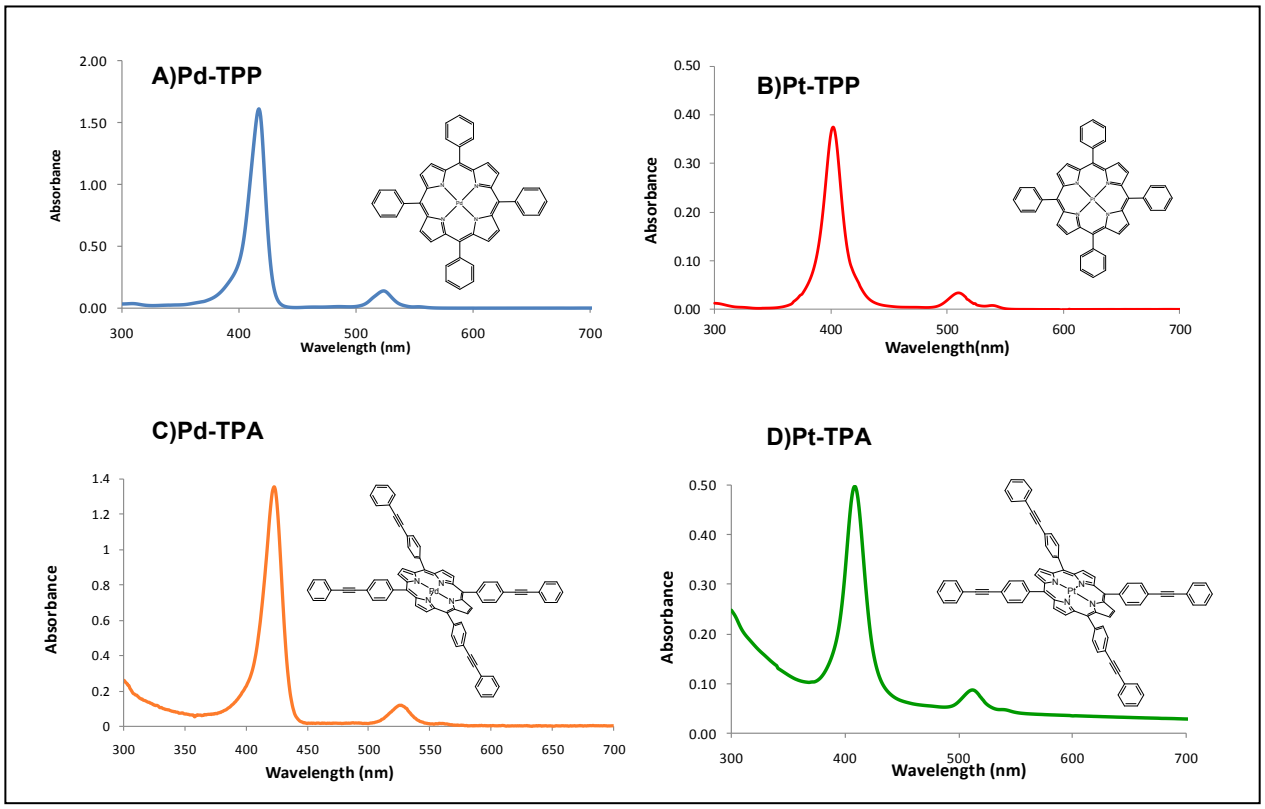

Figure S27.UV-VIS spectra ofA) **Pd-TPP**(~5×10-5 M), B)**Pt-TPP**(~2×10-5 M), C) **Pd-TPA**(~5×10-5 M), D) **Pt-TPA**(~2×10-5 M)in toluene.

Table S3. Absorbance spectra related data of the molecules in toluene and poly(TMSP)-based nanofibers.

Compound	Medium	λ_{abs}^{Bband} (nm)	log ε	λ_{abs}^{Q1band} (nm)	log ε	λ_{abs}^{Q2band} (nm)	log ε
Pd-TPP	Toluene	417	5.45	524	4.40	555	*
	Poly(TMSP)[a]	423	-	531	-	*	-
Pt-TPP	Toluene	403	5.43	509	5.40	540	3.80
	Poly(TMSP)[a]	408	-	516	-	546	-
Pd-TPA	Toluene	426	5.02	526	4.01	559	3.23
	Poly(TMSP)[a]	429	-	534	-	569	-
Pt-TPA	Toluene	409	5.12	515	4.35	545	
	Poly(TMSP)[a]	413	-	520	-	550	-

[a] thin film coated on mylar support

* The absorbance values were not enough to accurate report.

-Not calculated.

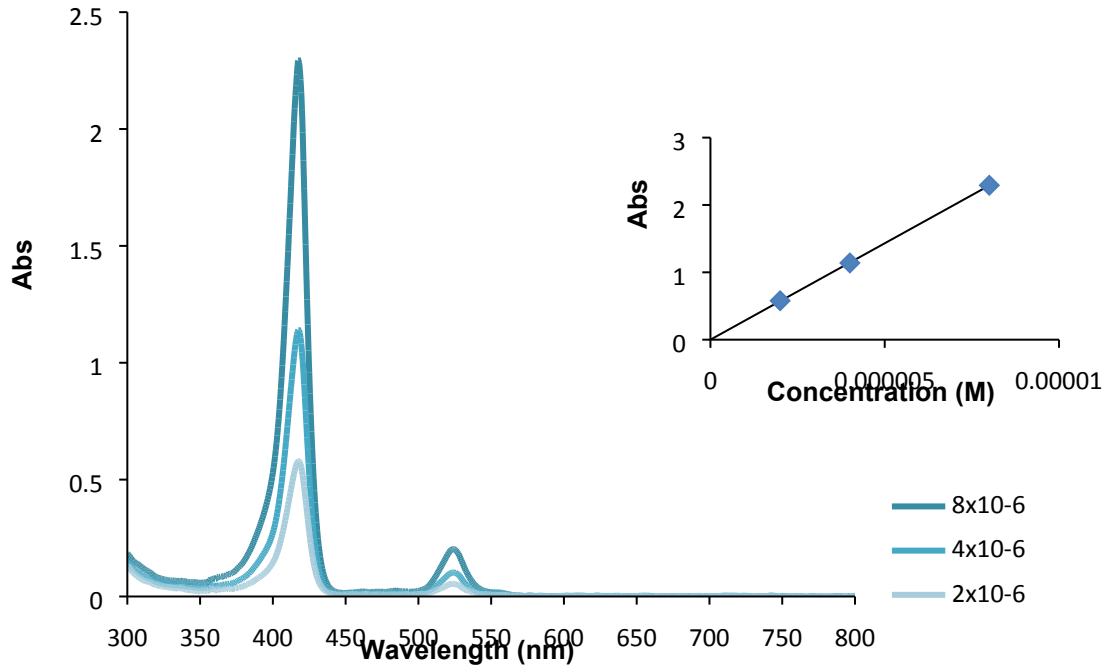

Figure S28: UV-Vis spectra of **Pd-TPP** in toluene at three different concentrations, inset: The plot of B band absorption intensities *vs* concentration.

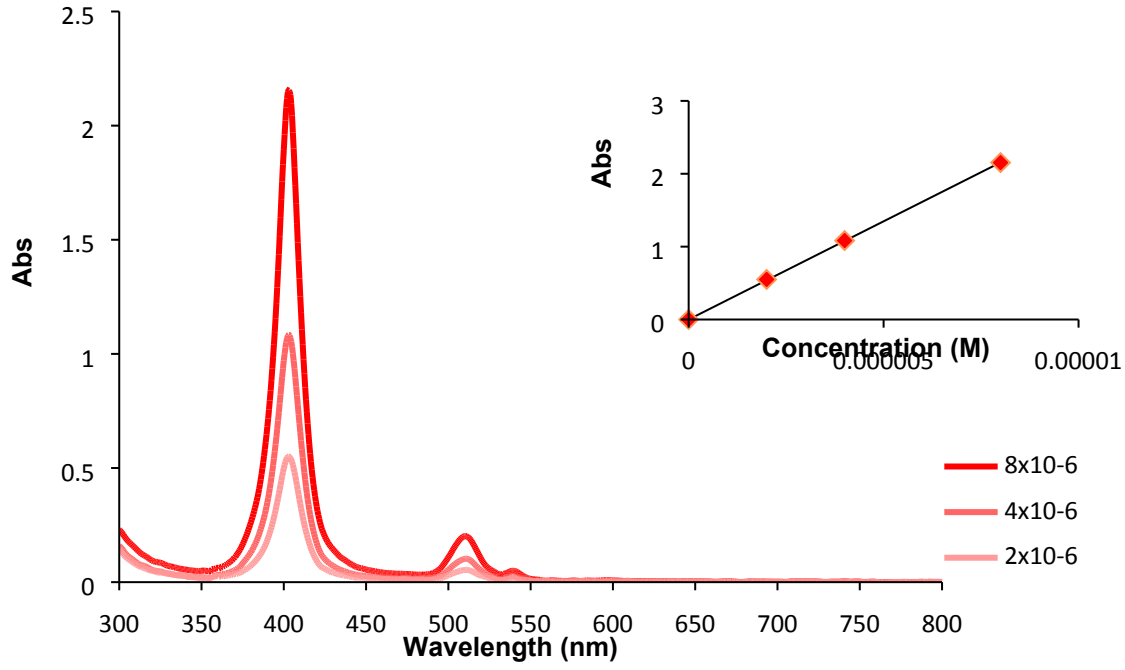

Figure S29: UV-Vis spectra of **Pt-TPP** in toluene at three different concentrations, inset: The plot of B band absorption intensities *vs* concentration.

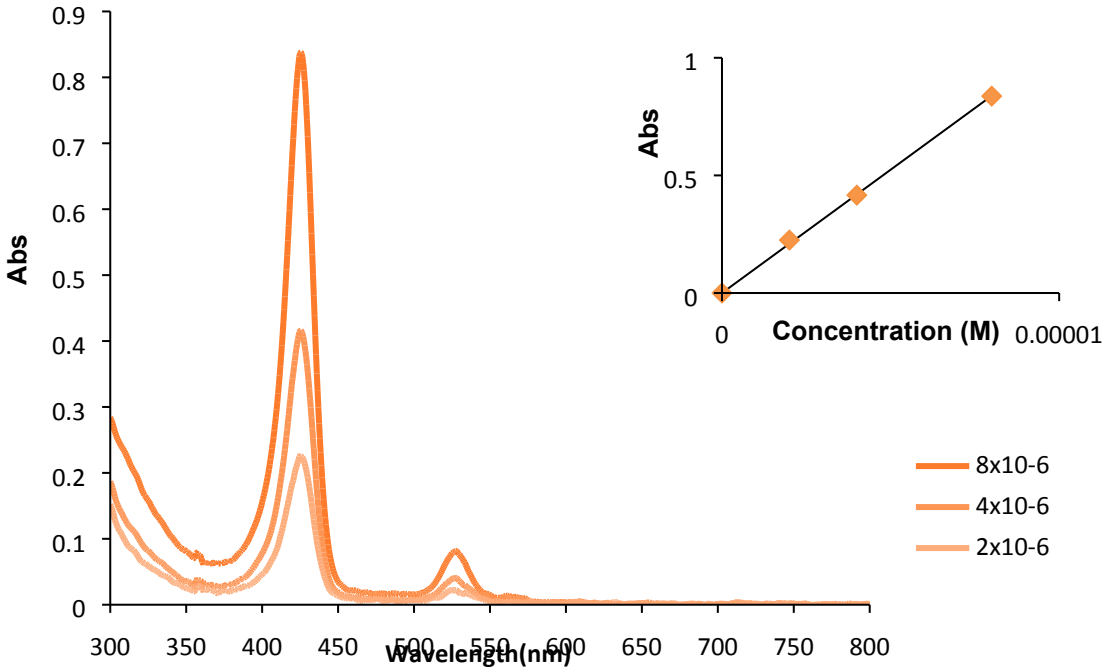

Figure S30: UV-Vis spectra of **Pd-TPA** in toluene at three different concentrations, inset: The plot of B band absorption intensities *vs* concentration.

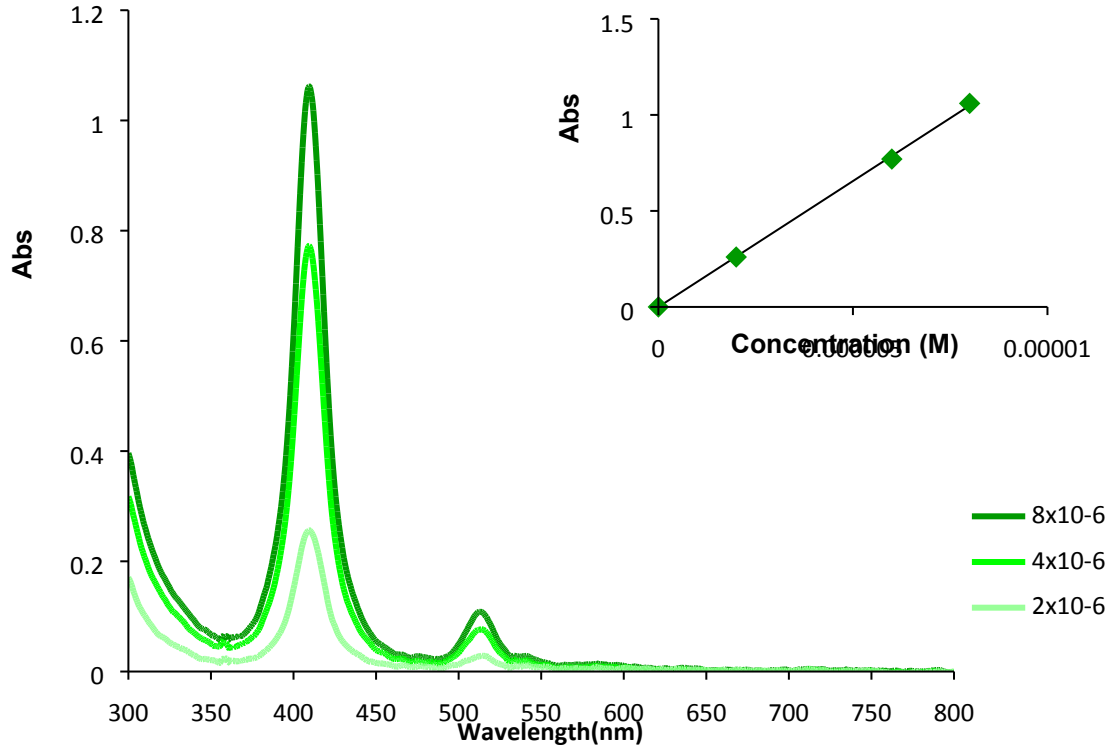

Figure S31: UV-Vis spectra of **Pt-TPA** in toluene at three different concentrations, inset: The plot of B band absorption intensities *vs* concentration.

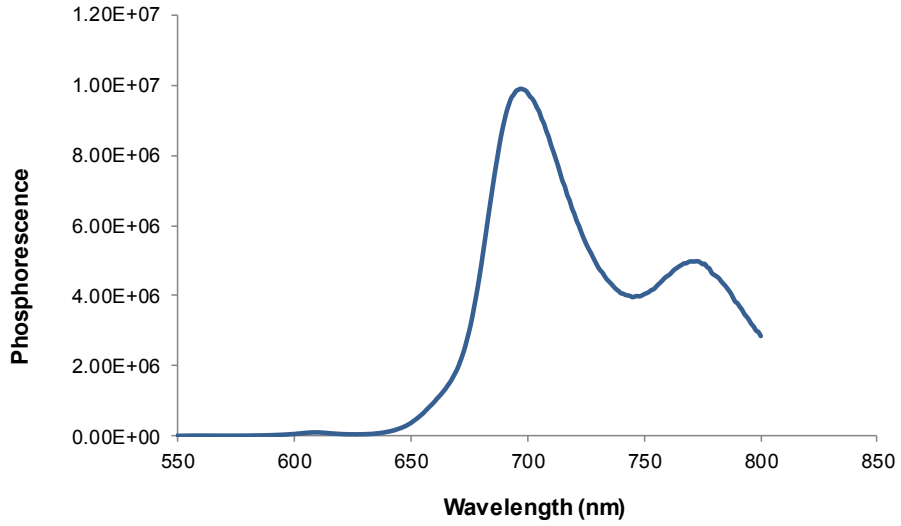

Figure S32. Phosphorescence emission spectra of **Pd-TPP** in toluene after exposure to argon gas (~8.3 ×10-6 M).

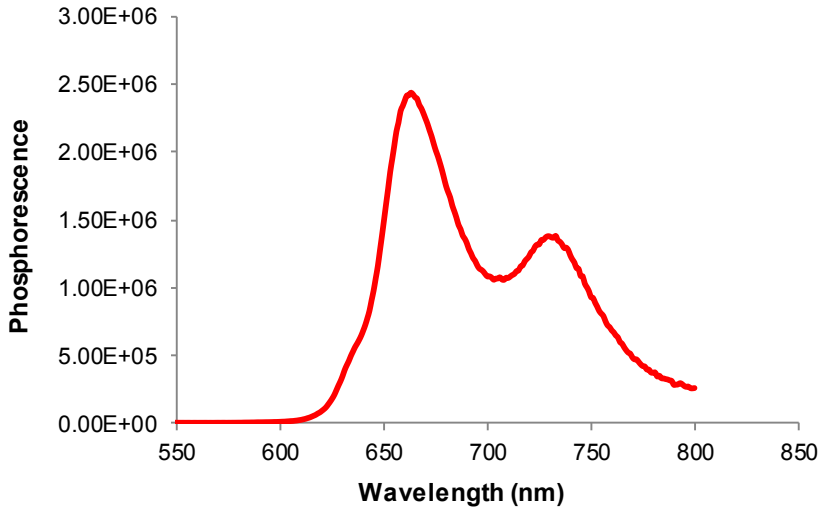

Figure S33. Phosphorescence emission spectra spectra of**Pt-TPP** in toluene after exposure to argon gas (~5.0 ×10^{-6} M).

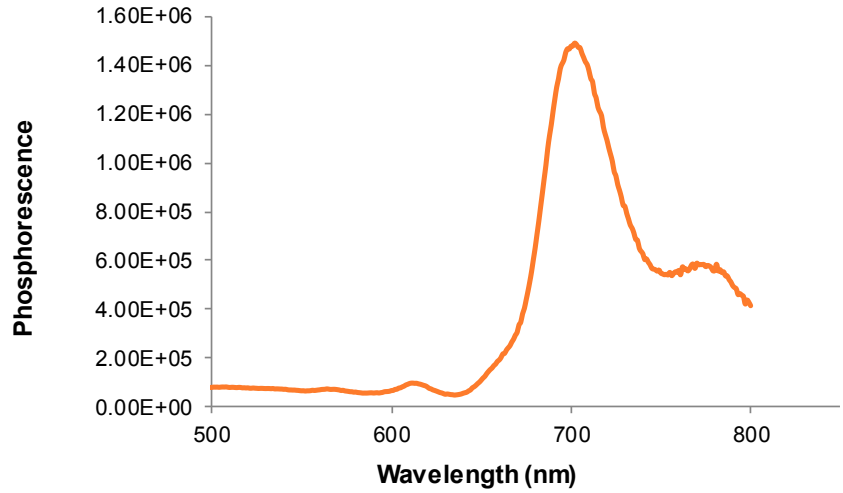

Figure S34. Phosphorescence emission spectra of **Pd-TPA** in toluene after exposure to argon gas (~5×10^{-6} M).

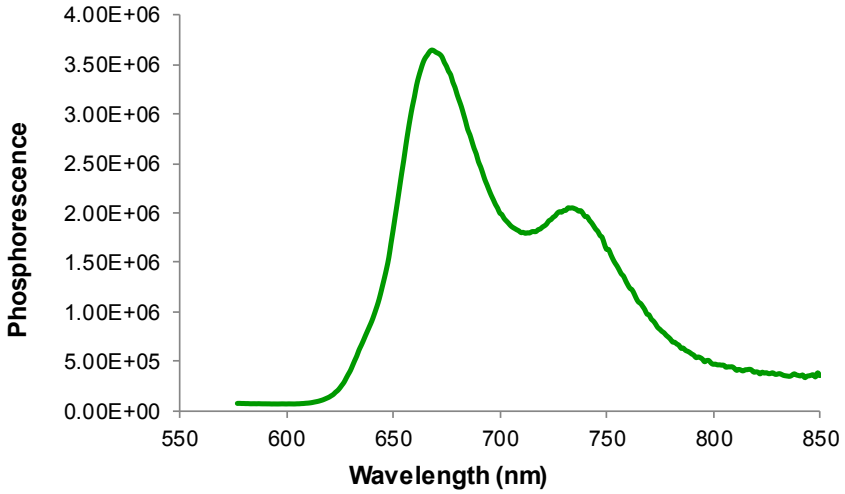

Figure S35. Phosphorescence emission spectra of **Pt-TPA** in toluene after exposure to argon gas (~3.8×10^{-6} M).

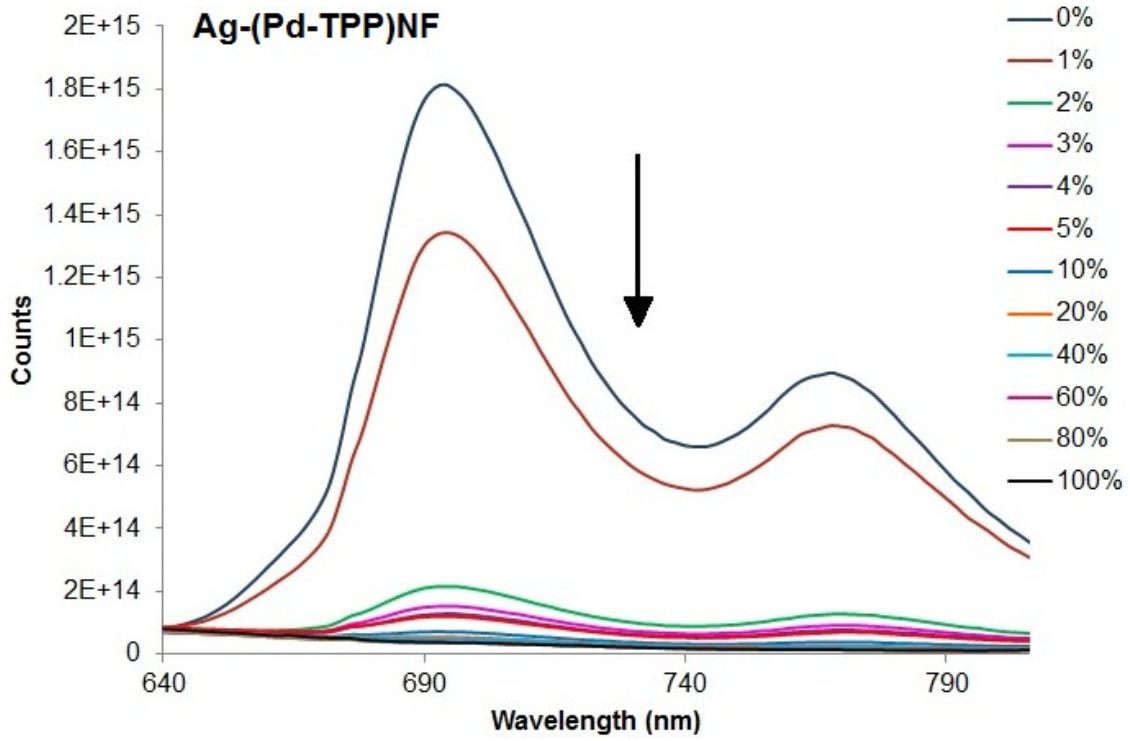

Figure S36.Emission spectra of **Ag-(Pd-TPP)NF** under small steps of O_2 partial pressures.

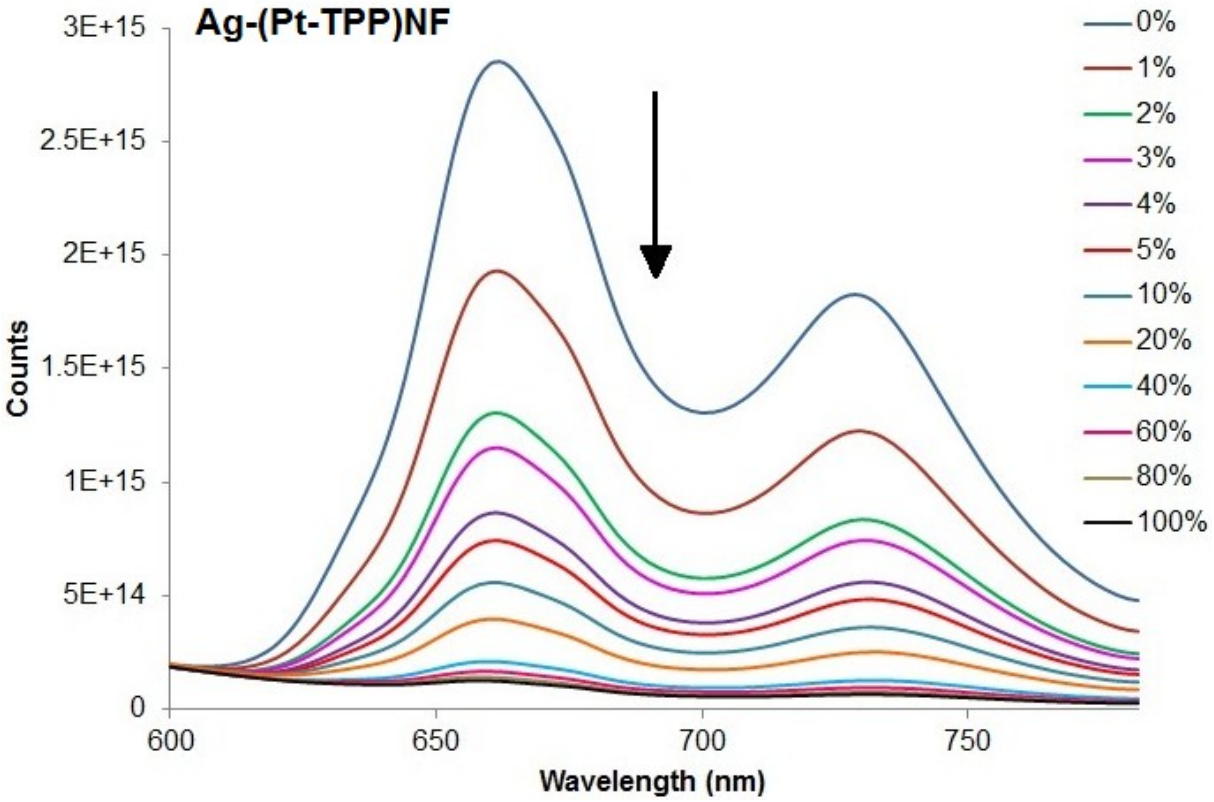

Figure S37. Emission spectra of **Ag-(Pt-TPP)NF** under small steps of O_2partial pressures.

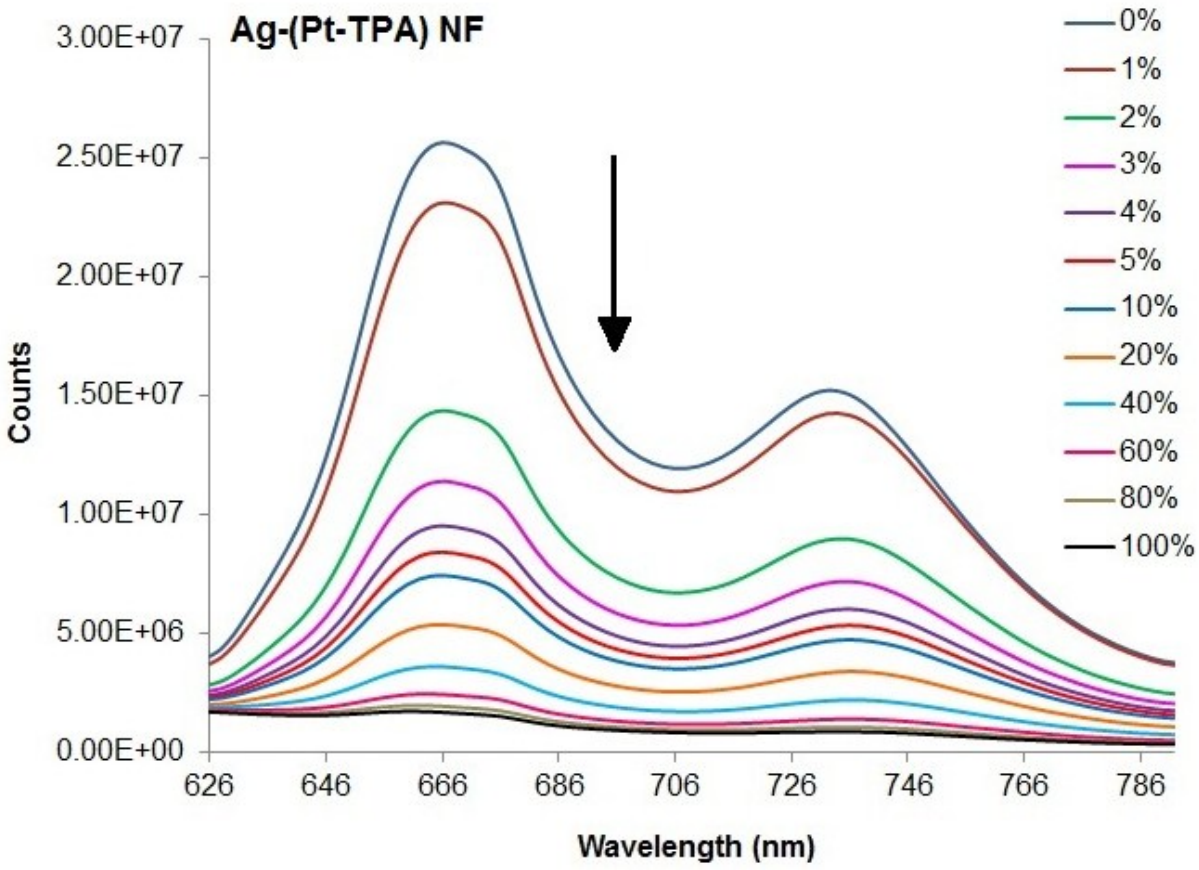

Figure S38. Emission spectra of **Ag-(Pt-TPA)NF** under small steps of O_2partial pressures.

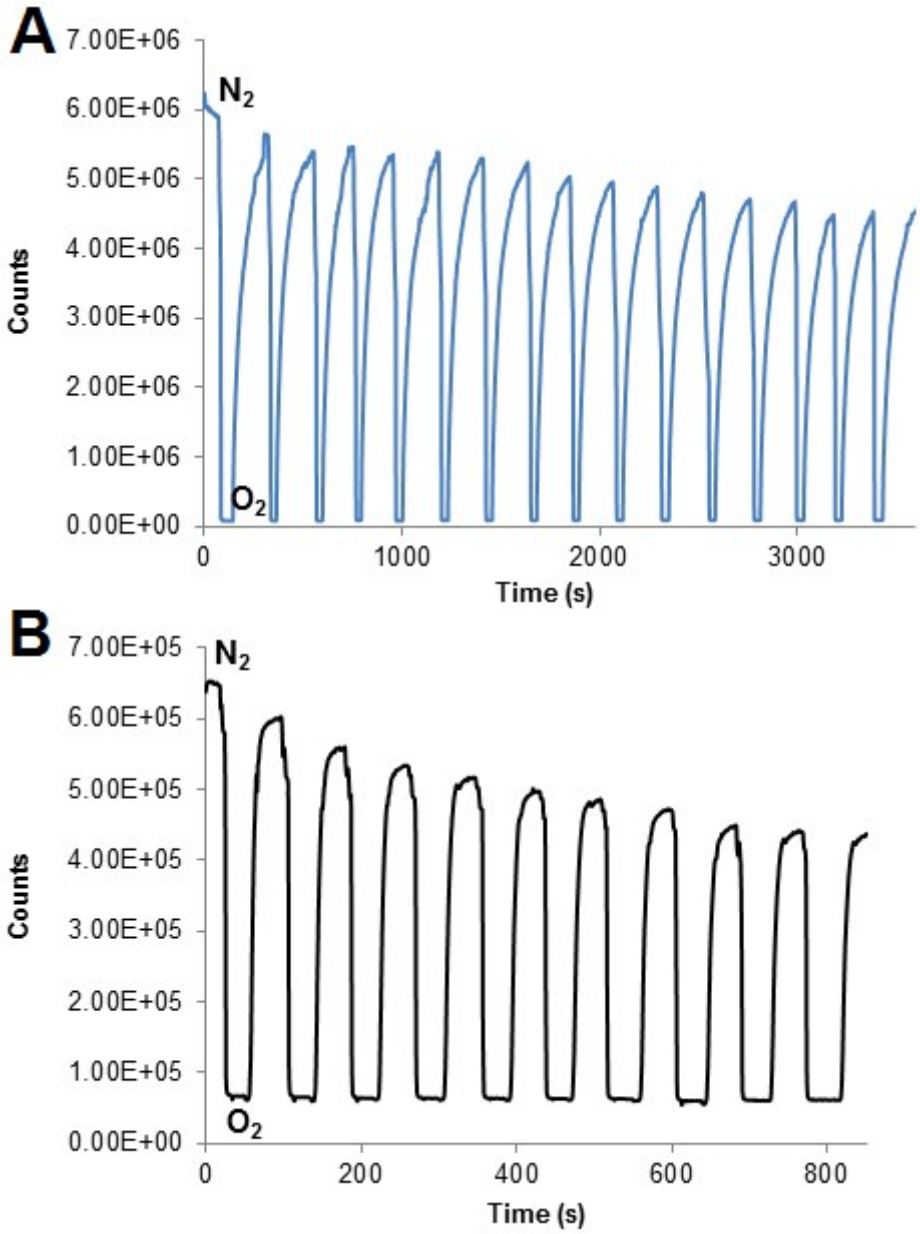

Figure S39. Time-based emission of **Pd-TPP** based nanofiber on going from 100 % O_2 to 100 % N_2 : (A) Nano Ag free nanofiber (B) nanofiber with nano Ag additive.

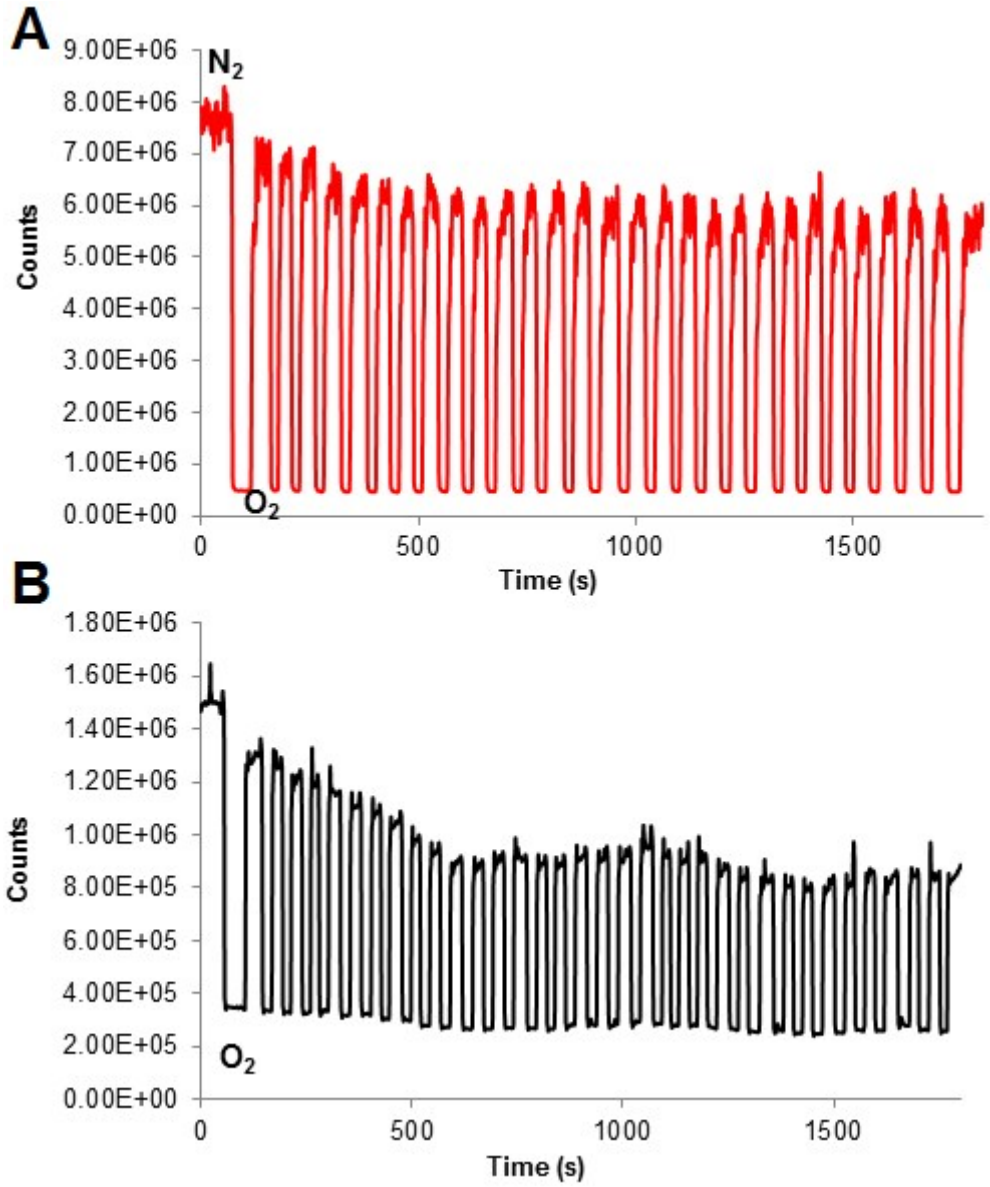

Figure S40. Time-based emission of **Pt-TPP** based nanofiber on going from 100 % O_2 to 100 % N_2 : (A) Nano Ag free nanofiber (B) nanofiber with nano Ag additive.

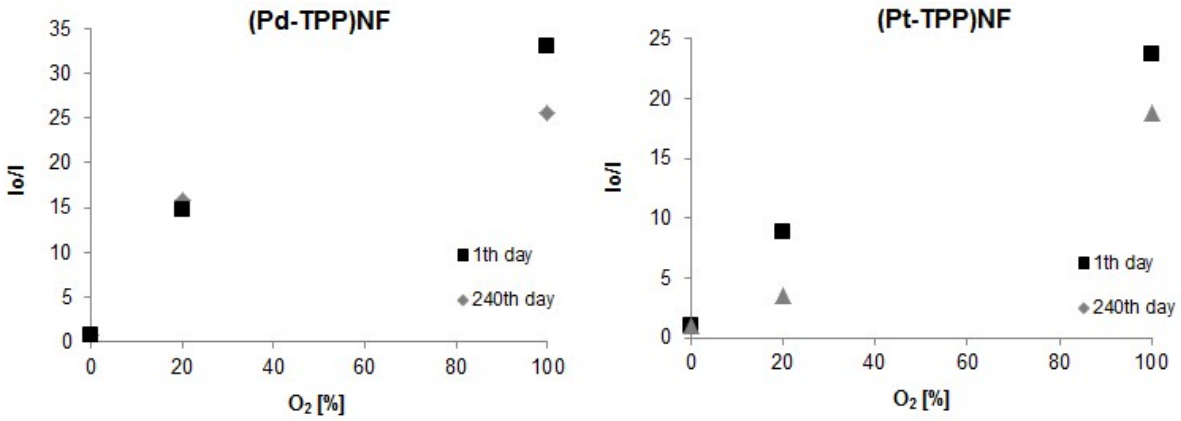

Figure S41. Repeatibility test results of **(Pd-TPP)NF**and **(Pt-TPA)NF**.

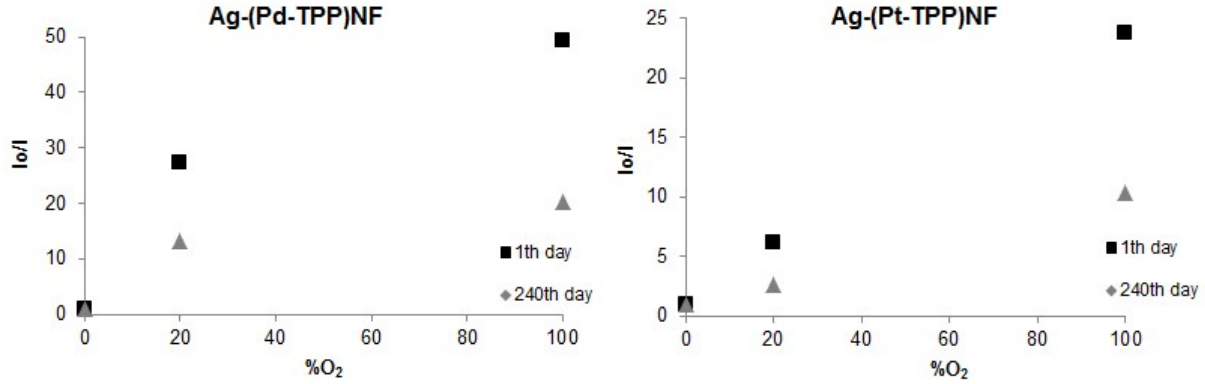

Figure S42. Repeatibility test results of A) **Ag-(Pd-TPP)NF**and B) **Ag-(PtTPP)NF**.