Supporting Information:

Solvent extraction ability of new diethylphosphate modified thiacalix[6]arene towards PGM solution

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Supporting Information includes,

1. Experimental Section

Materials and instrumentations

All solvents were purchased from commercial sources, and used as received. *p*-^{t}Bu-thiacalix[6]arene was prepared according to our previously reported procedures.[S1] NMR data were recorded on JEOL 600SSS ECA-600 instrument. Chemical shifts are quoted as parts per million (ppm) relative to tetra metyl silane ($CDCl_3$). Fourier transform infrared (FT-IR) spectra were measured using Thermo Fisher Scientific Nicolet iS5 spectrophotometer (attenuated total reflection (ATR) method). Electronic absorption spectra were recorded on a Shimadzu UV 3600 double-beam spectrophotometer using 1-cm matched quartz cells. Mass spectra were recorded on matrix-assisted laser desorption-ionization time-of-flight mass spectrometry (MALDI-TOF MS, Bruker auto flex speed- AK1). Elemental analysis was performed on a Systems Engineering CE-440M CHN/O/S elemental analyzer.

References

(S1) (a) Y. Kondo, K. Endo, N. Iki, S. Miyano and F. Hamada, *J. Incl. Phenom. Macrocycl. Chem*., **2005**, *52*, 45; (b) Y. Kondo and F. Hamada, *J. Incl. Phenom.Macrocycl.Chem*.,**2007**, *58*, 123. (c) T.Kimuro, M. Yamada, F. Hamada, *J. Incl. Phenom. Macrocycl. Chem*.,DOI: 10.1007/s10847.014.0435.1

Table S1: Concentrations of metal ions in the diluted ACR solution

Metal ions	$[M]_{aqu}$ mg/L
Al	343.66
Ba	316.966
Ce	645.862
La	98.8332
Pd	102.8432
Pt	66.342
Rh	38.0834
Y	3.4904
Zr	26.672

Table S2: Extractability of 2 from the ACR solution

Metal ions	E % of **2**
Al	0
Ba	0
Ce	0
La	0
Pd	0
Pt	0
Rh	0
Y	0
Zr	99.99

Table S3: Concentrations of metal ions in the standard PGM solution

Metal ions	$[M]_{aqu}$ mg/L
Al	41.1332
Ba	36.3888
Ce	40.8002
La	40.7332
Pd	41.3454
Pt	40.9312
Rh	39.1184
Y	37.2176

Table S4: Extractability of 2 from the standard PGM solution at various pH.

Metal ions	E % of **2**			
	pH:0	pH:1	pH:2	pH:3
Al	0	3.3	2.2	4.02
Ba	2	1.8	0	0
Ce	1.18	0	0	1.78
La	1.79	2	0	2.01
Pd	5.11	16.5	38.3	99.98
Pt	1.048	0	0	2.68
Rh	3.09	3.5	2	5.22
Y	0	2.2	2	2.6

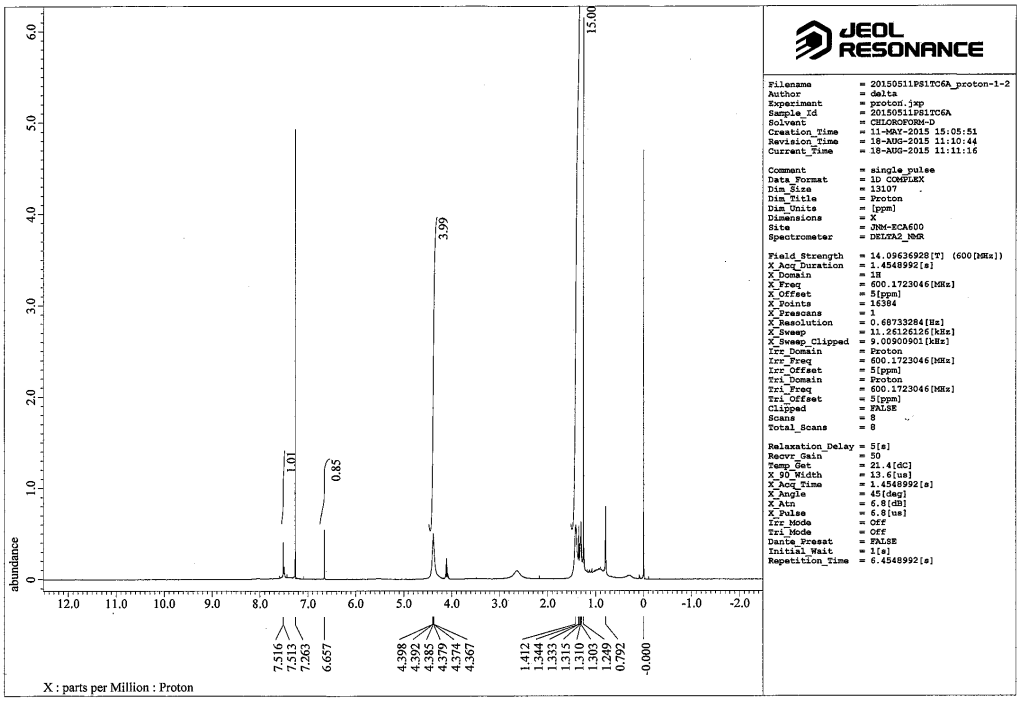

Fig. S1: 1H NMR of 2

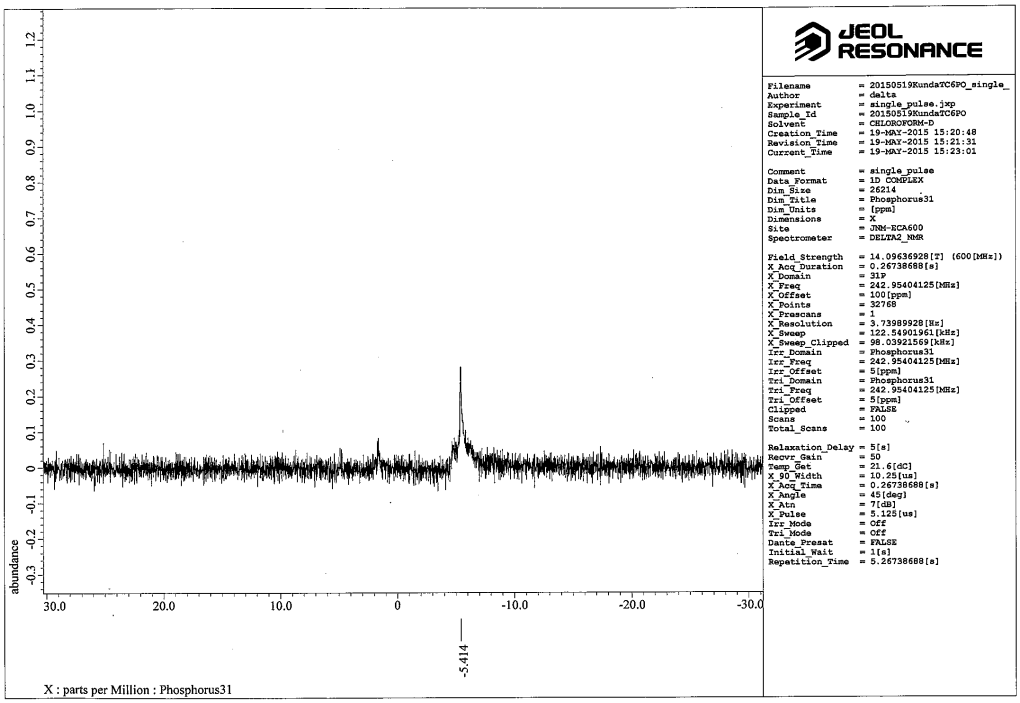

Fig. S2: ^{31}P NMR of 2

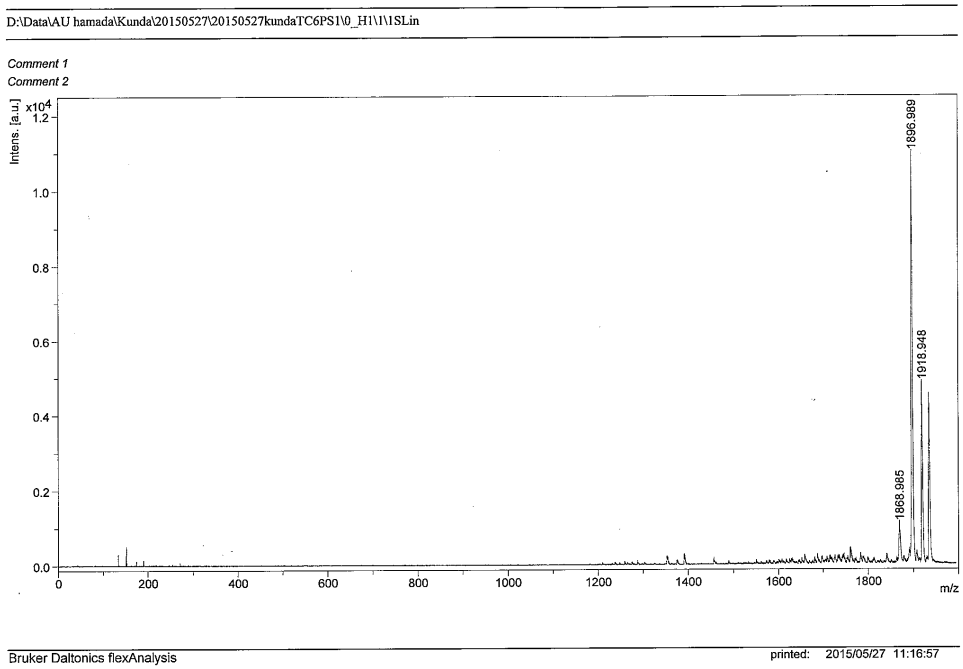

Fig. S3: TOF-Mass Spectrum of 2