Electronic Supplementary Information

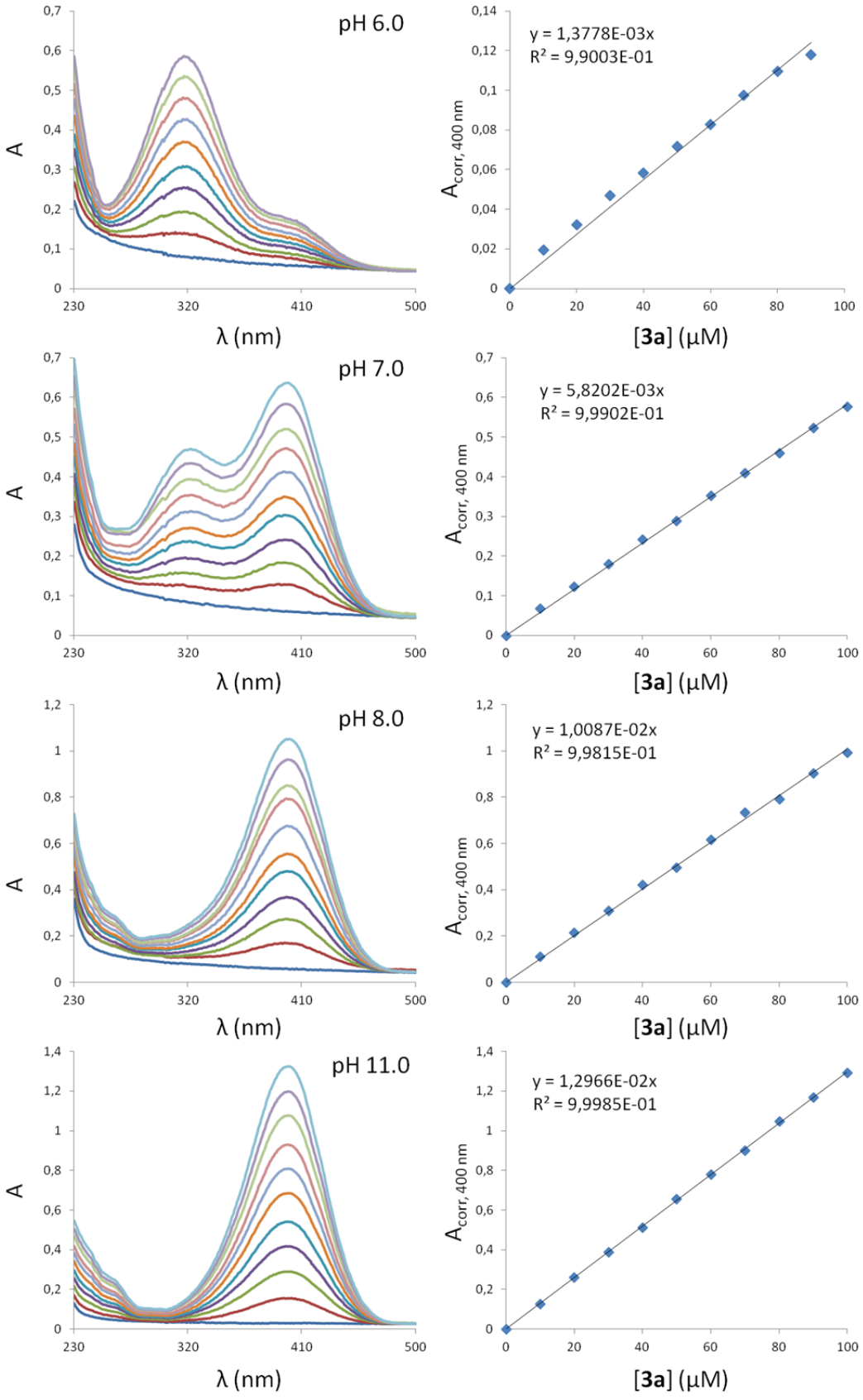
Catalytic Signal Amplification for the Discrimination of ATP and ADP using Functionalised Gold Nanoparticles

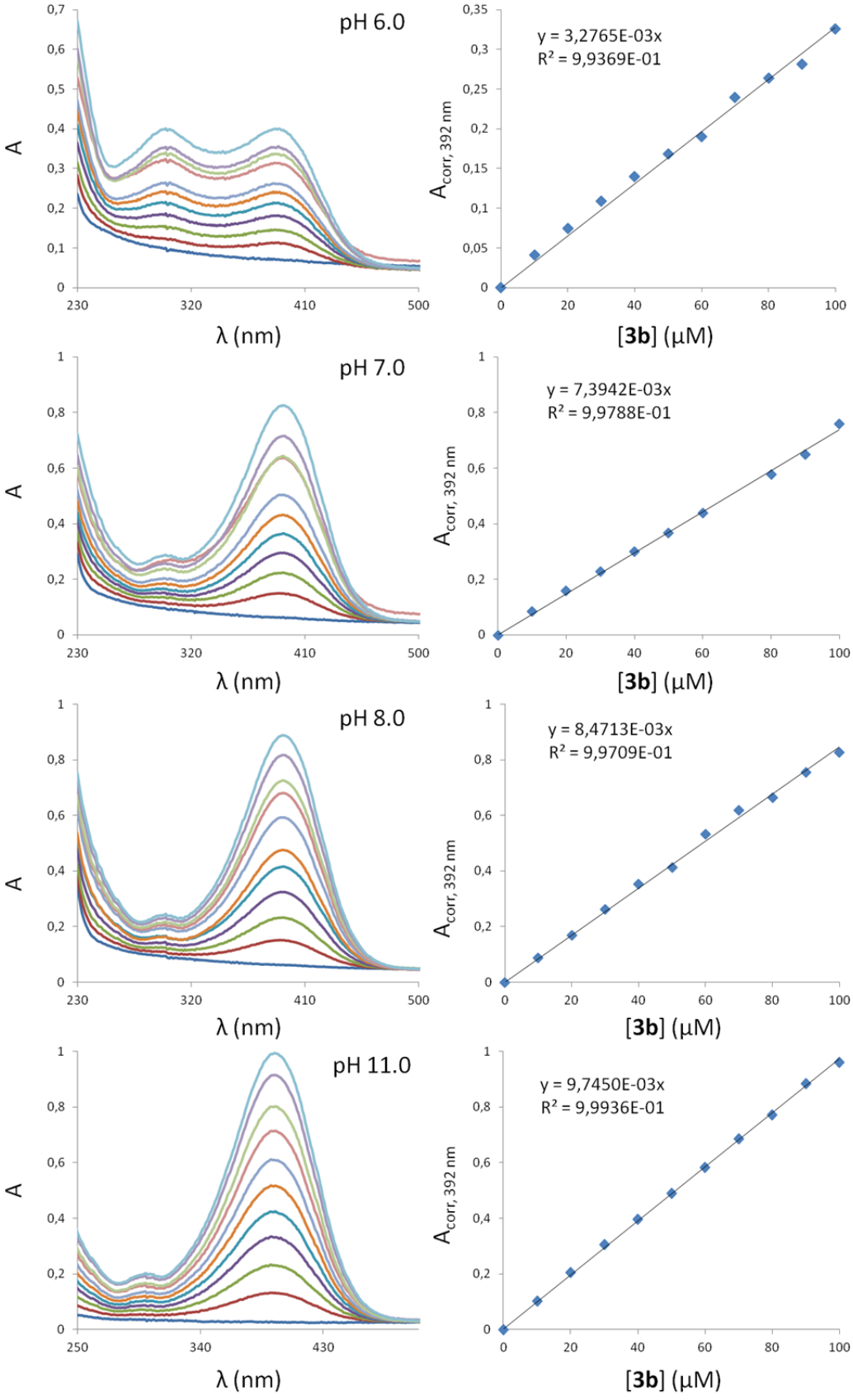
Cristian Pezzato, Jack L.-Y. Chen, Patrizia Galzerano, Michela Salvi and Leonard J. Prins*

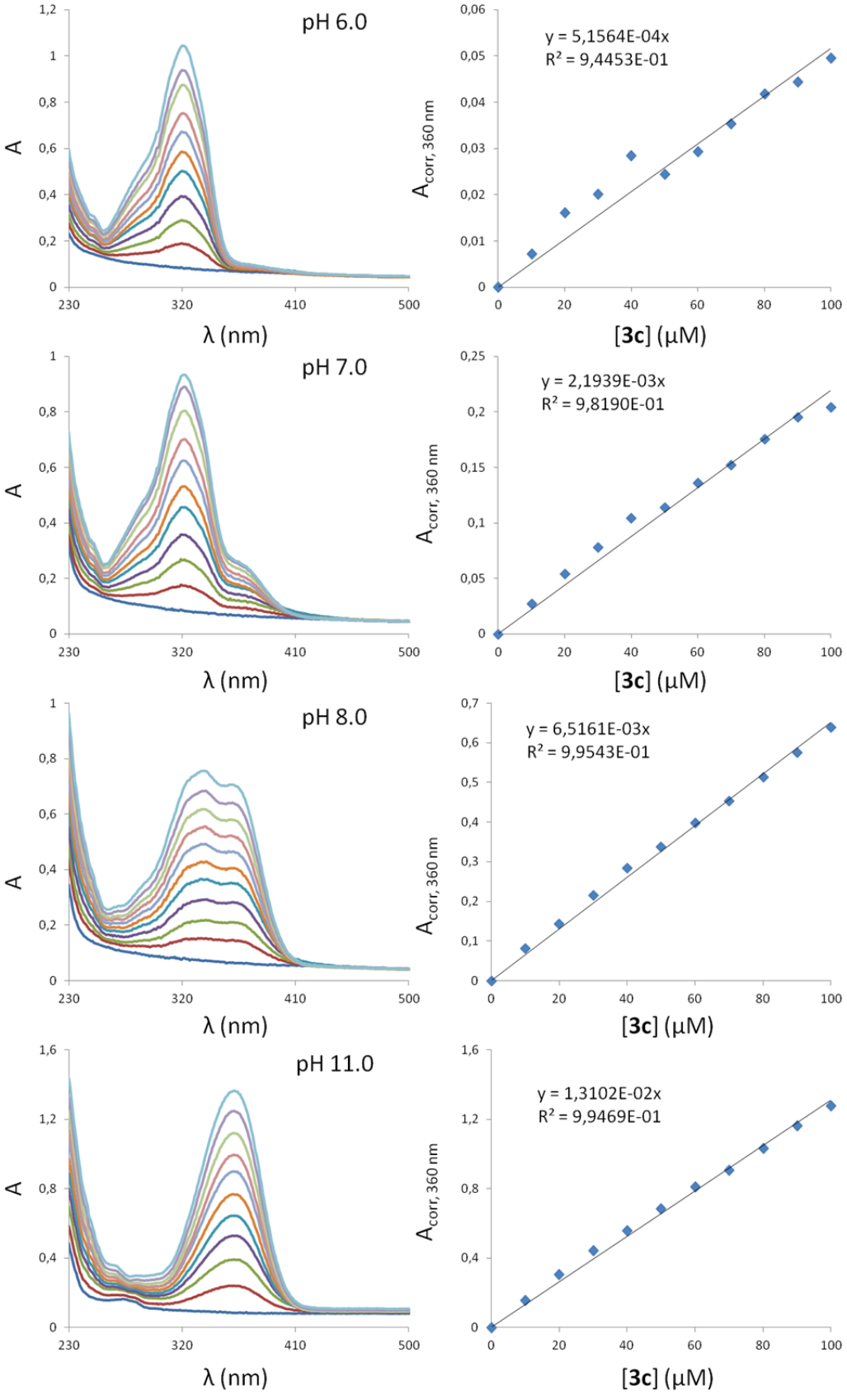
Department of Chemical Sciences, University of Padova,
Via Marzolo 1, 35121 Padova (Italy)
E-mail: leonard.prins@unipd.it

Contents

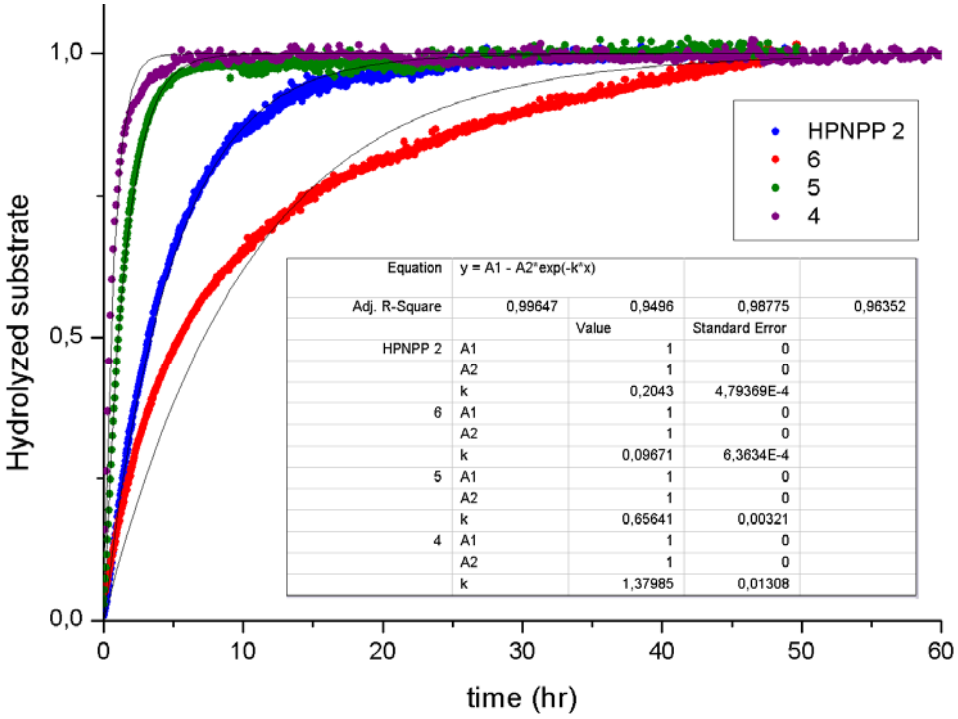
1. Calibration curves




pH 6.0
A
λ (nm)
y = 3,2765E-03x
R² = 9,9369E-01
A corr, 392 nm
[3b] (μM)
pH 7.0
A
λ (nm)
y = 7,3942E-03x
R² = 9,9788E-01
A corr, 392 nm
[3b] (μM)
pH 8.0
A
λ (nm)
y = 8,4713E-03x
R² = 9,9709E-01
A corr, 392 nm
[3b] (μM)
pH 11.0
A
λ (nm)
y = 9,7450E-03x
R² = 9,9936E-01
A corr, 392 nm
[3b] (μM)

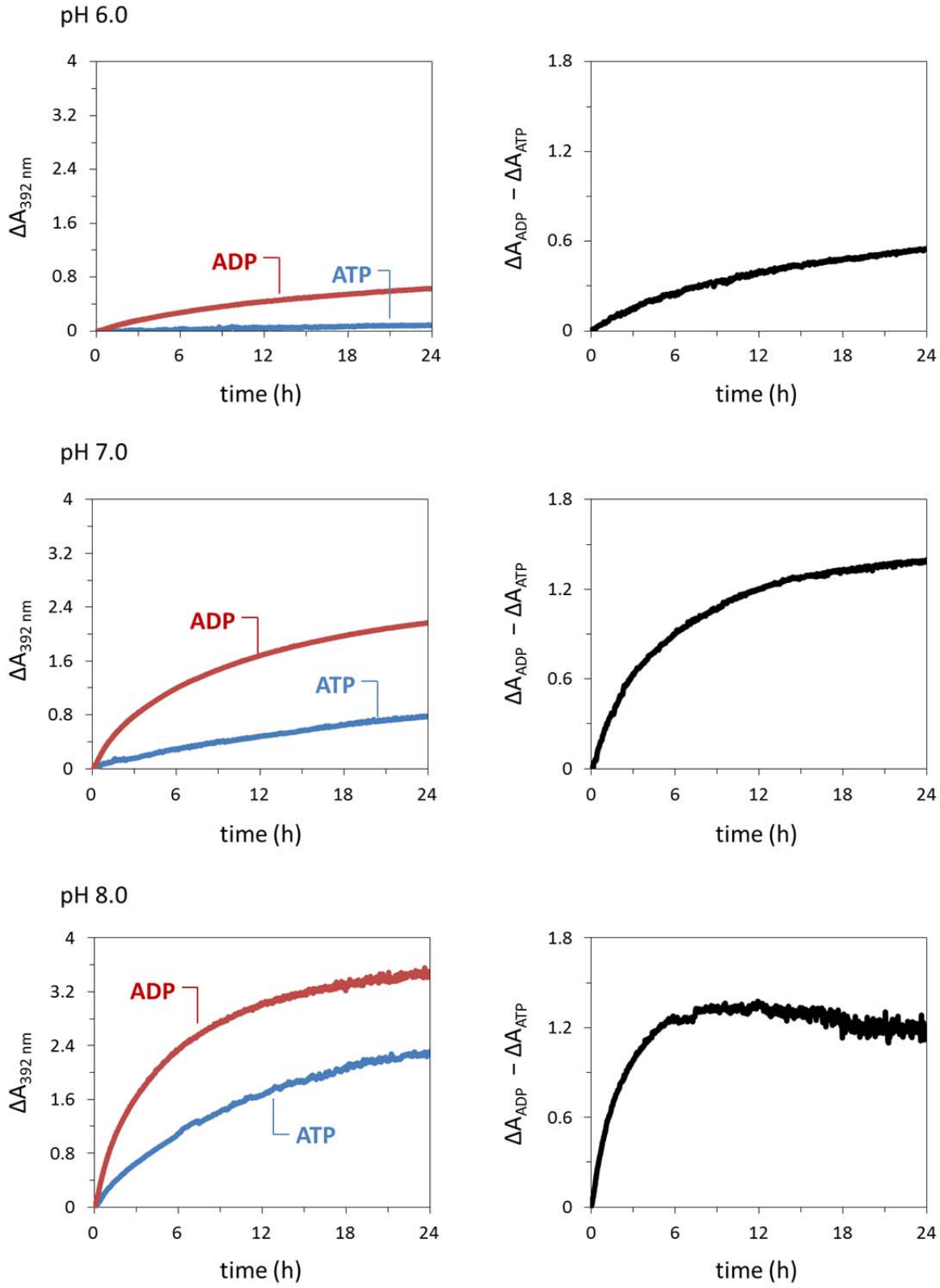

pH 6.0
A
λ (nm)
y = 5,1564E-04x
R² = 9,4453E-01
Acorr, 360 nm
[3c] (μM)
pH 7.0
A
λ (nm)
y = 2,1939E-03x
R² = 9,8190E-01
Acorr, 360 nm
[3c] (μM)
pH 8.0
A
λ (nm)
y = 6,5161E-03x
R² = 9,9543E-01
Acorr, 360 nm
[3c] (μM)
pH 11.0
A
λ (nm)
y = 1,3102E-02x
R² = 9,9469E-01
Acorr, 360 nm
[3c] (μM)

2. *Alkaline hydrolysis study*



Substrate	k_{obs} (s^{-1})	k_{obs} / $k_{obs,\ HPNPP}$	R^2
HPNPP 2	$5.7 \cdot 10^{-5}$	-	1.00
4	$3.8 \cdot 10^{-4}$	6.8	0.95
5	$1.8 \cdot 10^{-4}$	3.2	0.99
6	$2.7 \cdot 10^{-5}$	0.5	0.96

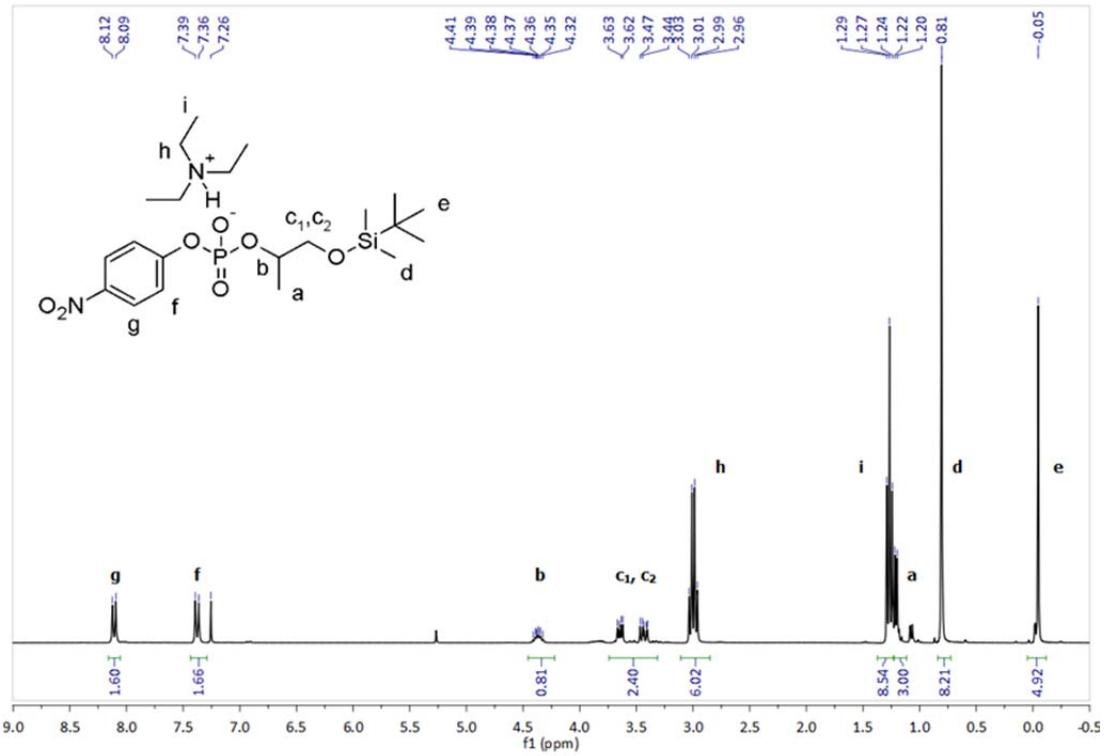
3. Signal amplification at different pHs



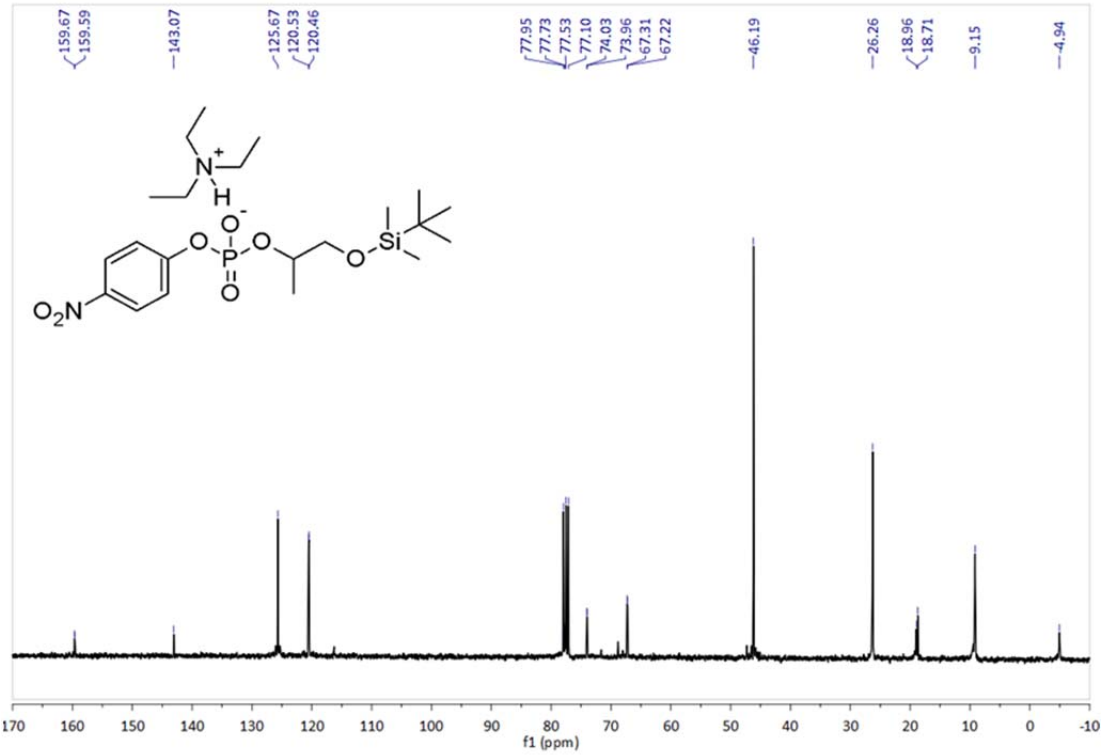
4. Spectra for novel compounds

2-[(*tert*-Butyldimethylsilyl)oxy]ethyl-1-yl 4-nitrophenyl phosphate, TEA salt (10)

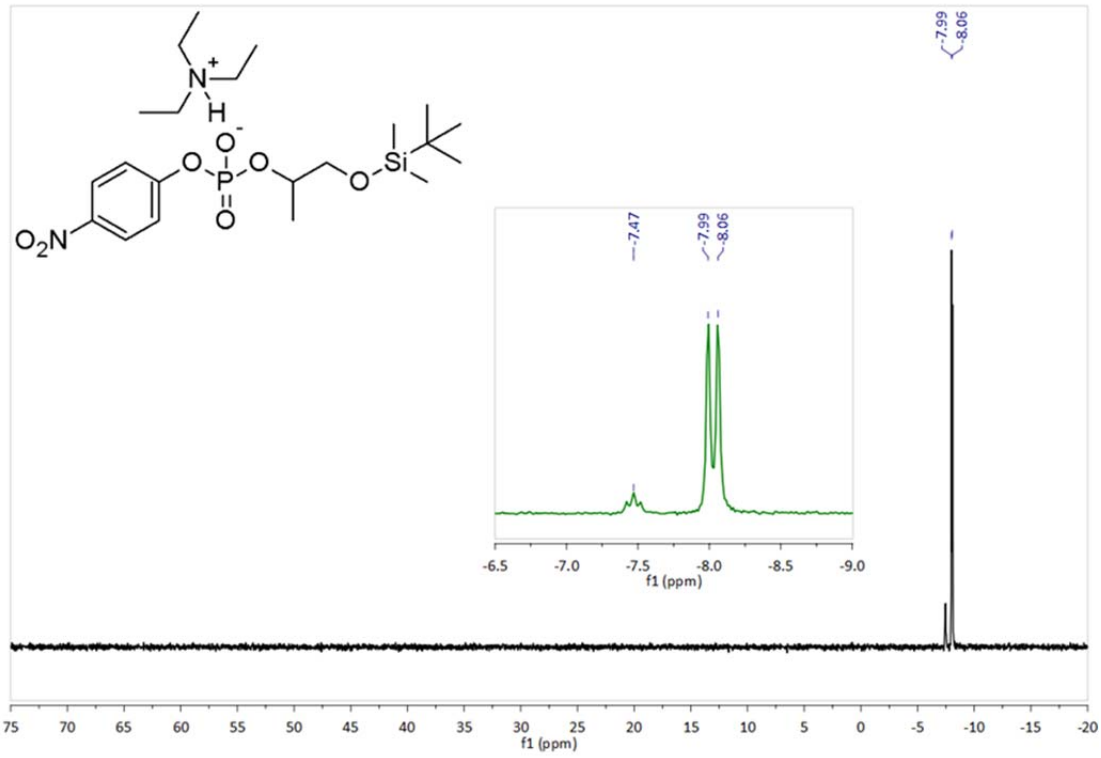
^{1}H-NMR ($CDCl_3$)



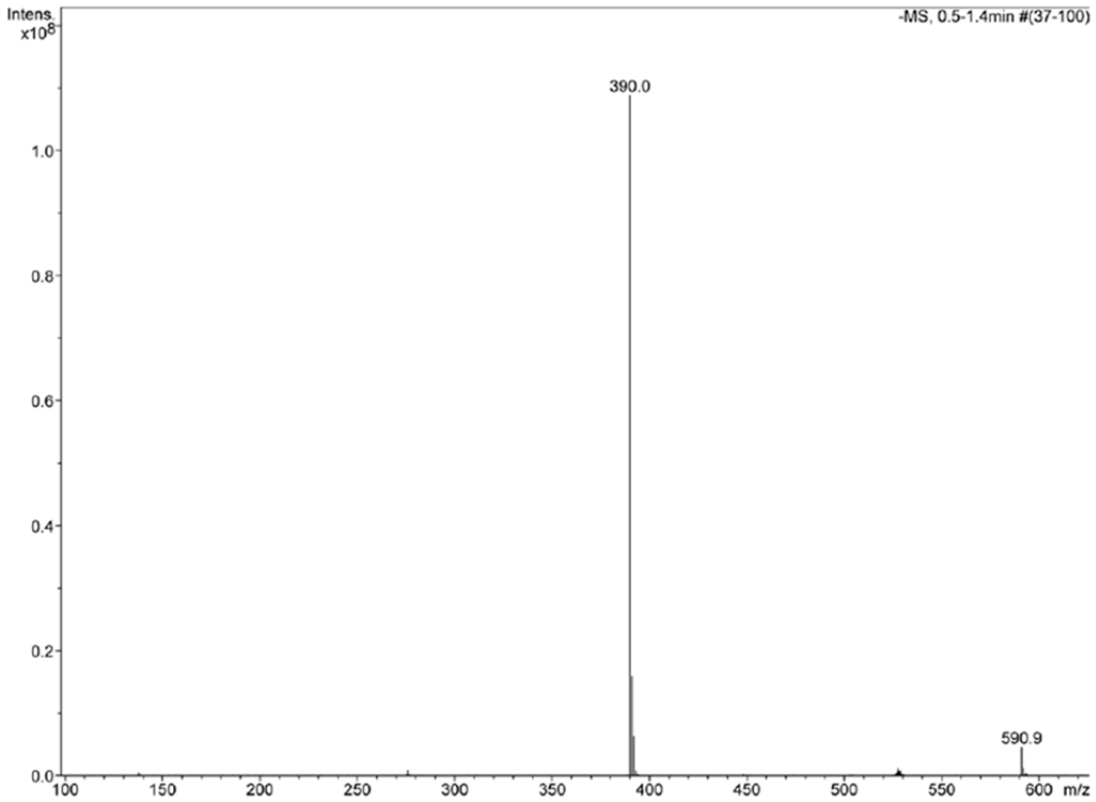
^{13}C-NMR ($CDCl_3$)



^{31}P-NMR ($CDCl_3$)

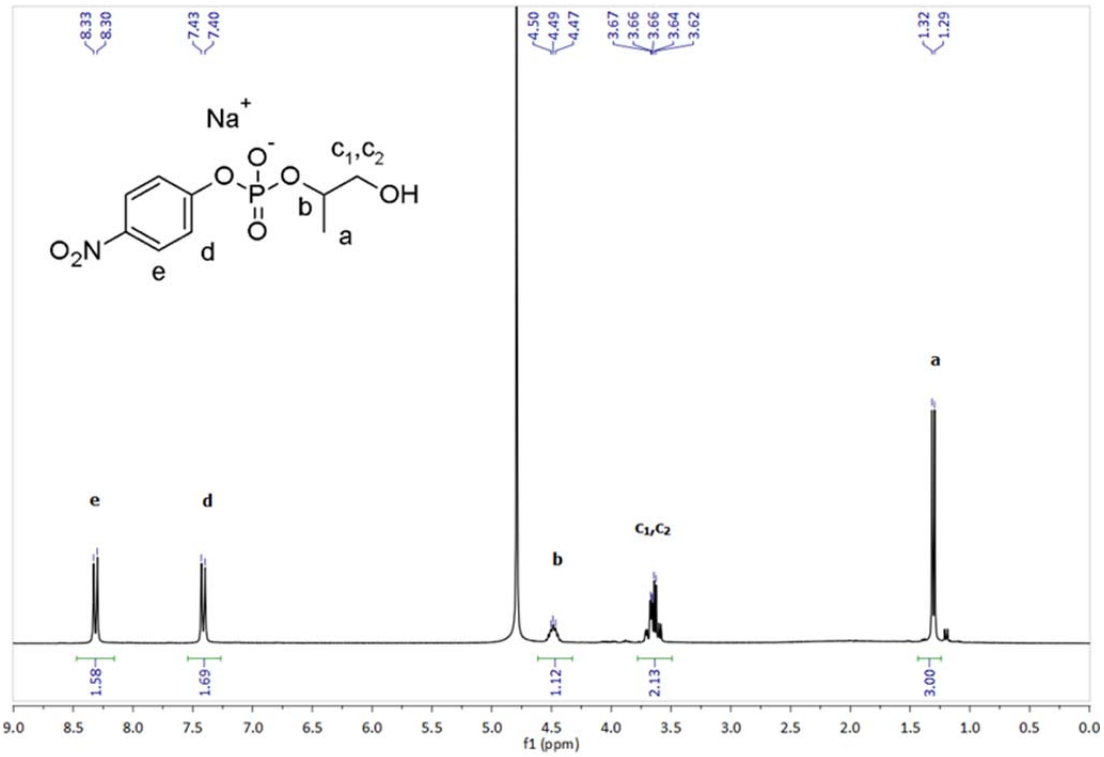


MS-ESI(-)

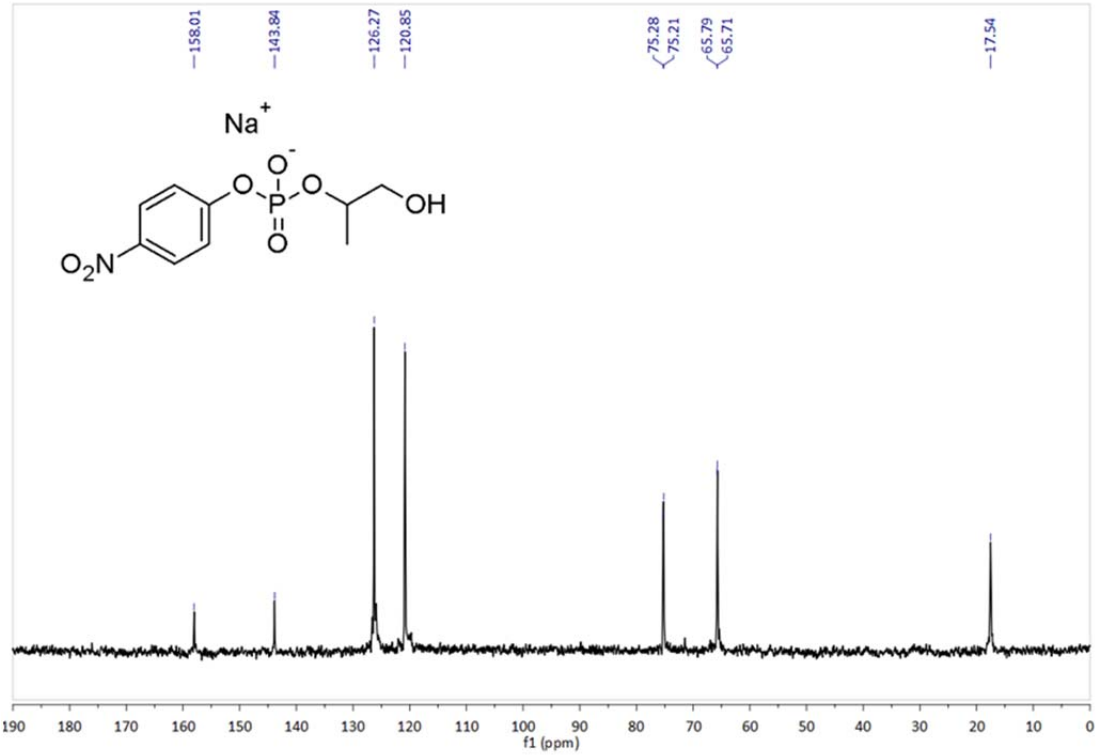


2-Hydroxyethyl-1-yl 4-nitrophenyl phosphate, sodium salt (4)

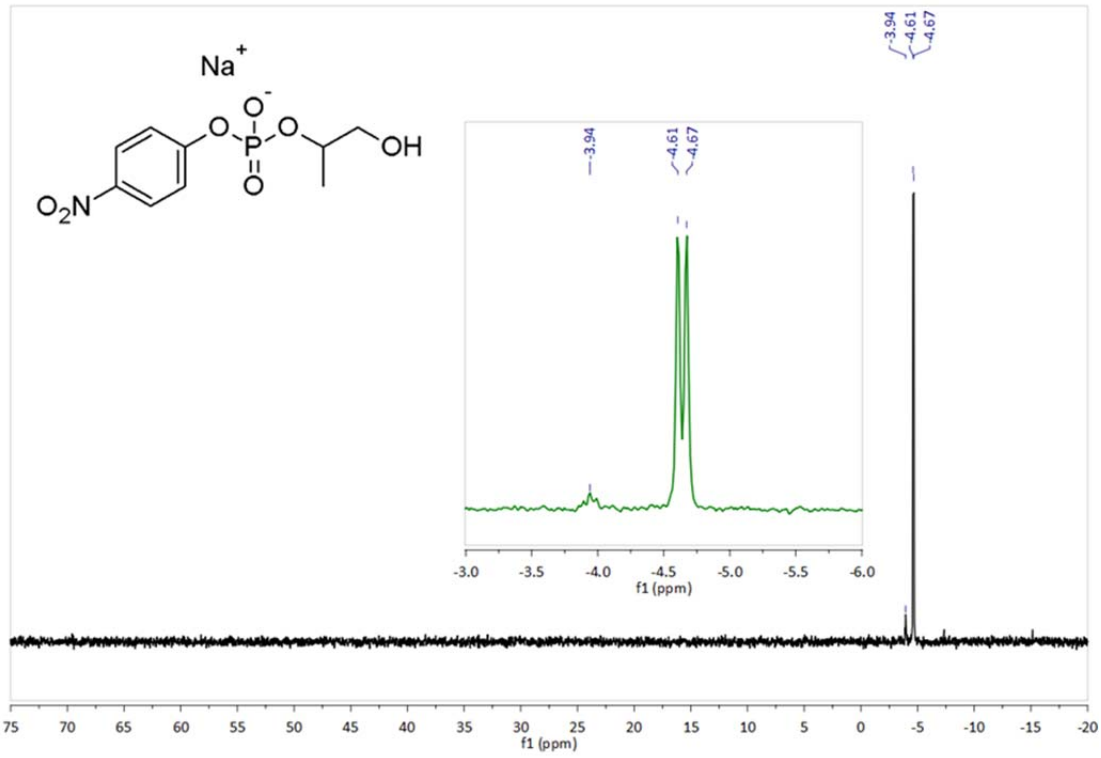
^{1}H-NMR (D_2O)



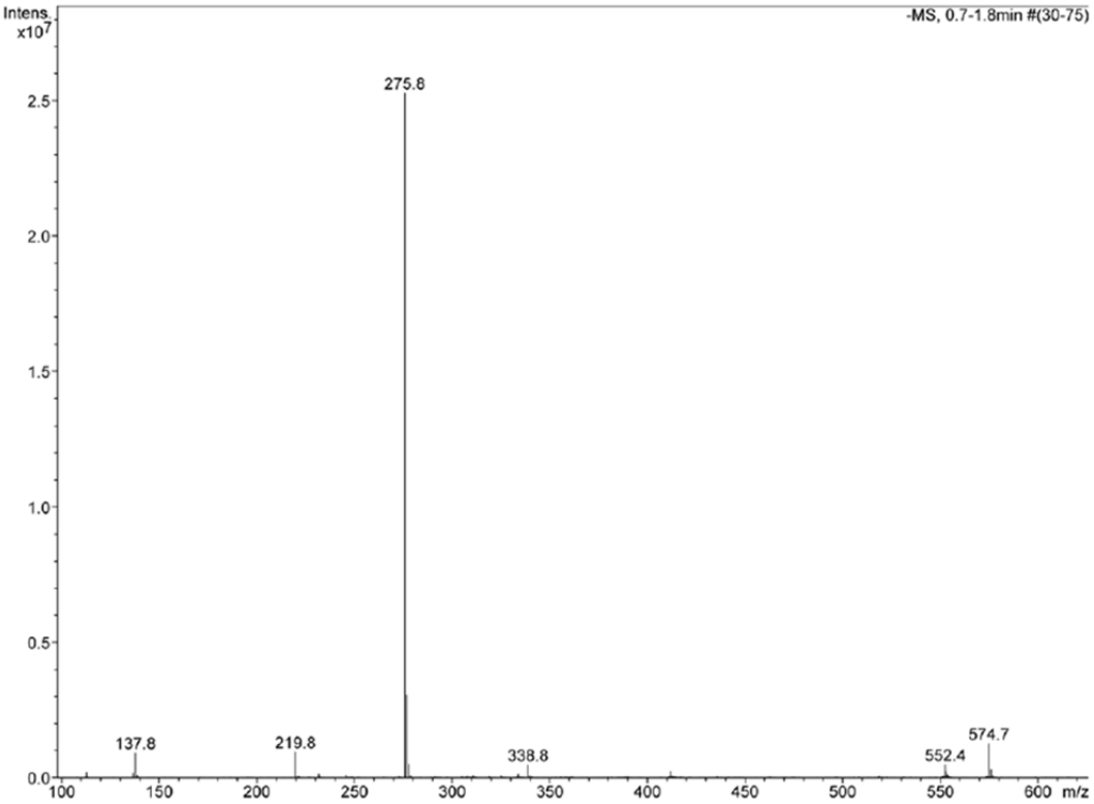
^{13}C-NMR (D_2O)



^{31}P-NMR (D_2O)

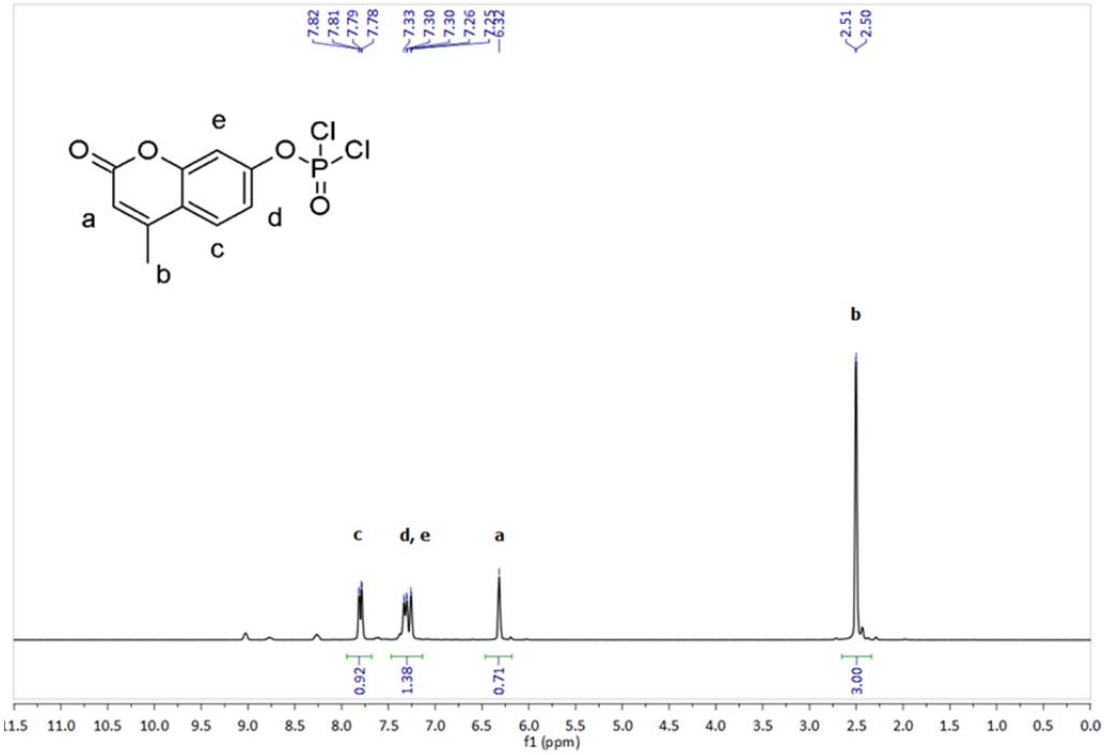


MS-ESI (-)

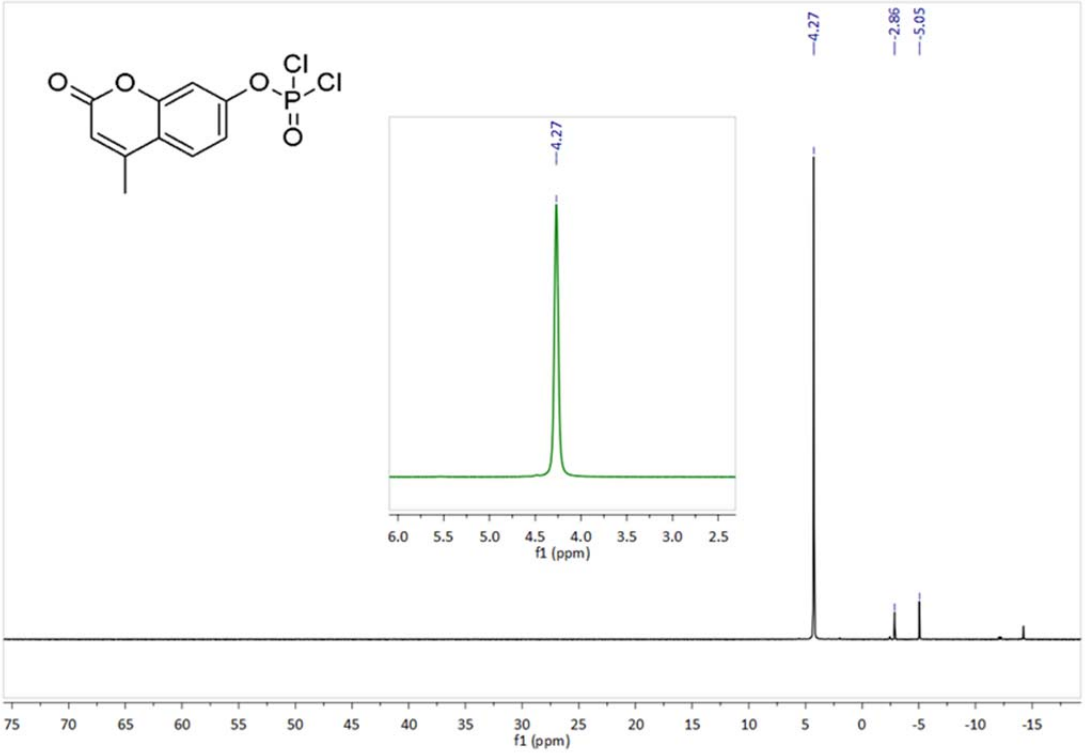


4-Methylumbelliferyl phosphodichloridate (7c)

^{1}H-NMR ($CDCl_3$)

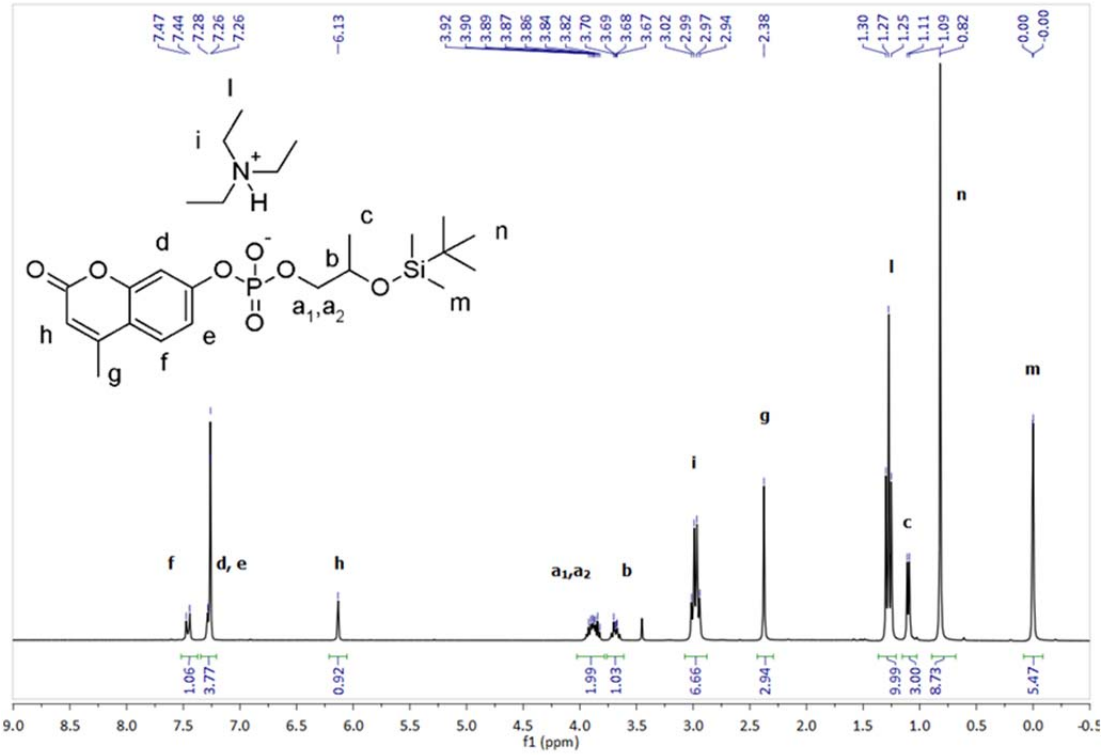


^{31}P-NMR ($CDCl_3$)

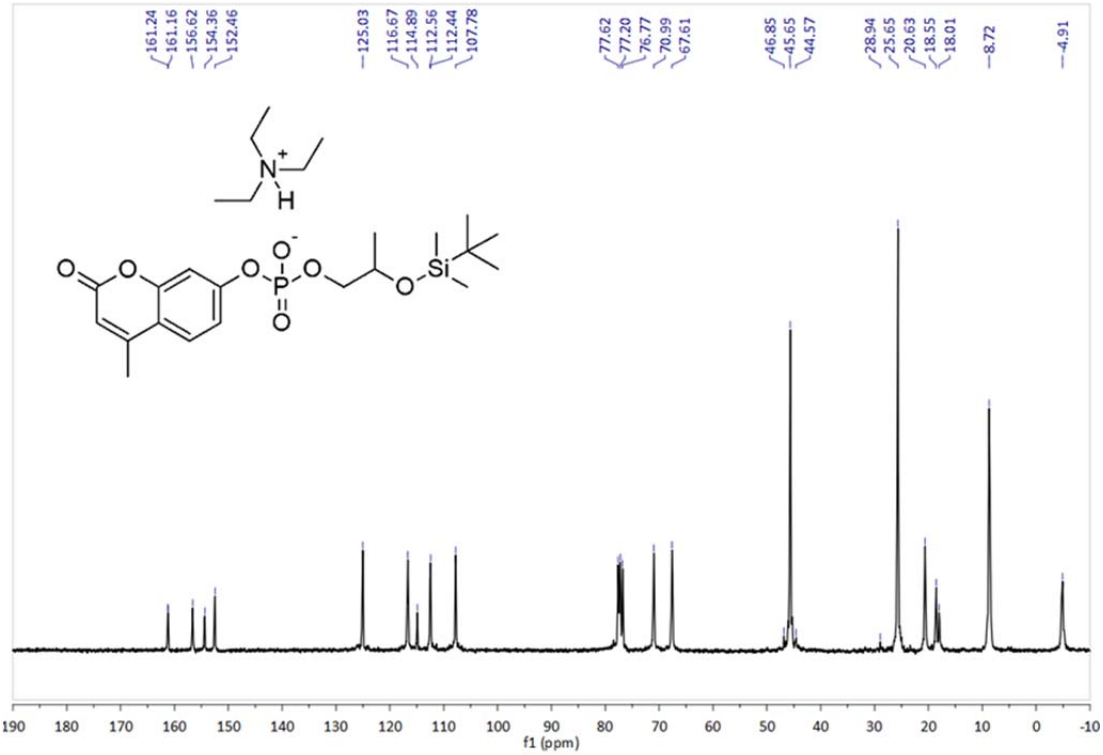


2-[(*tert*-Butyldimethylsilyl)oxy]propyl 4-methylumbelliferyl phosphate, TEA salt (11c)

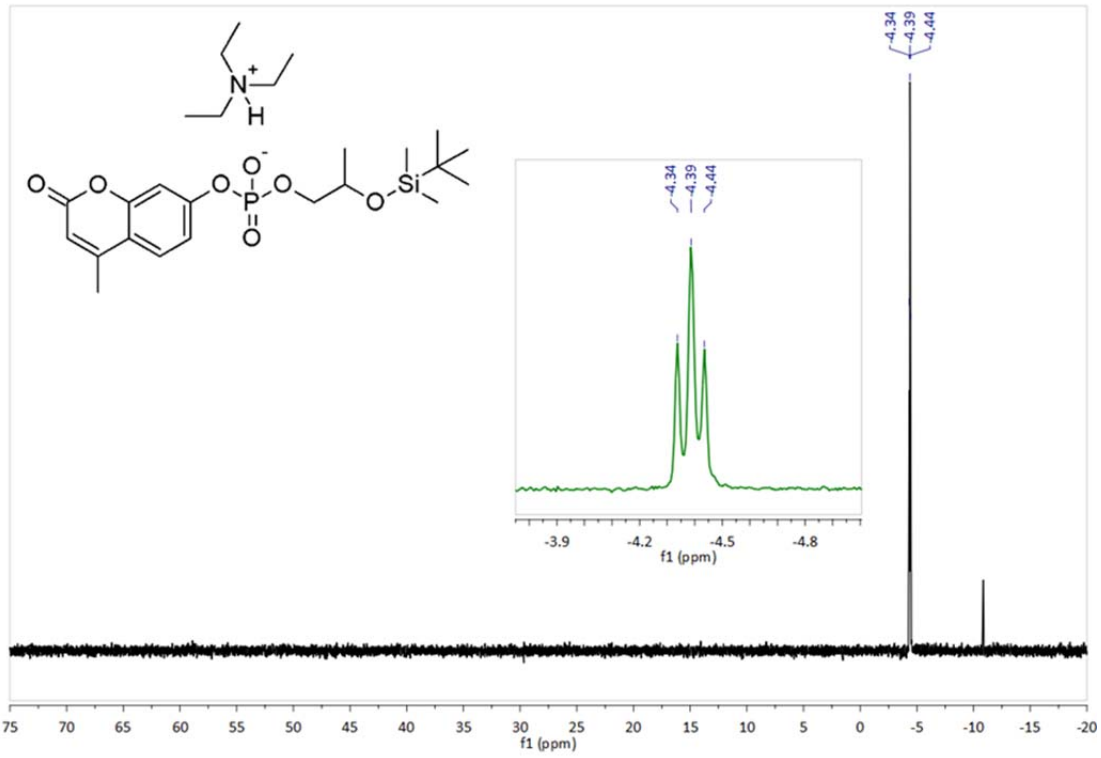
^{1}H-NMR ($CDCl_3$)



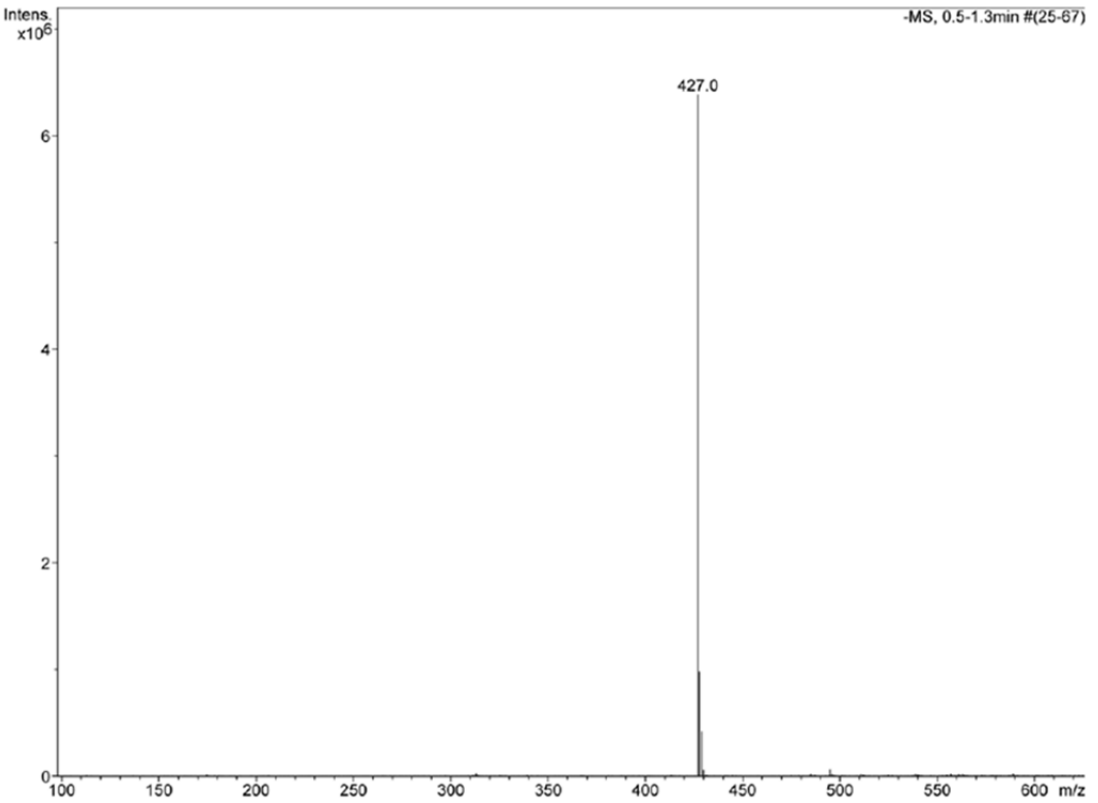
^{13}C-NMR($CDCl_3$)



^{31}P-NMR($CDCl_3$)

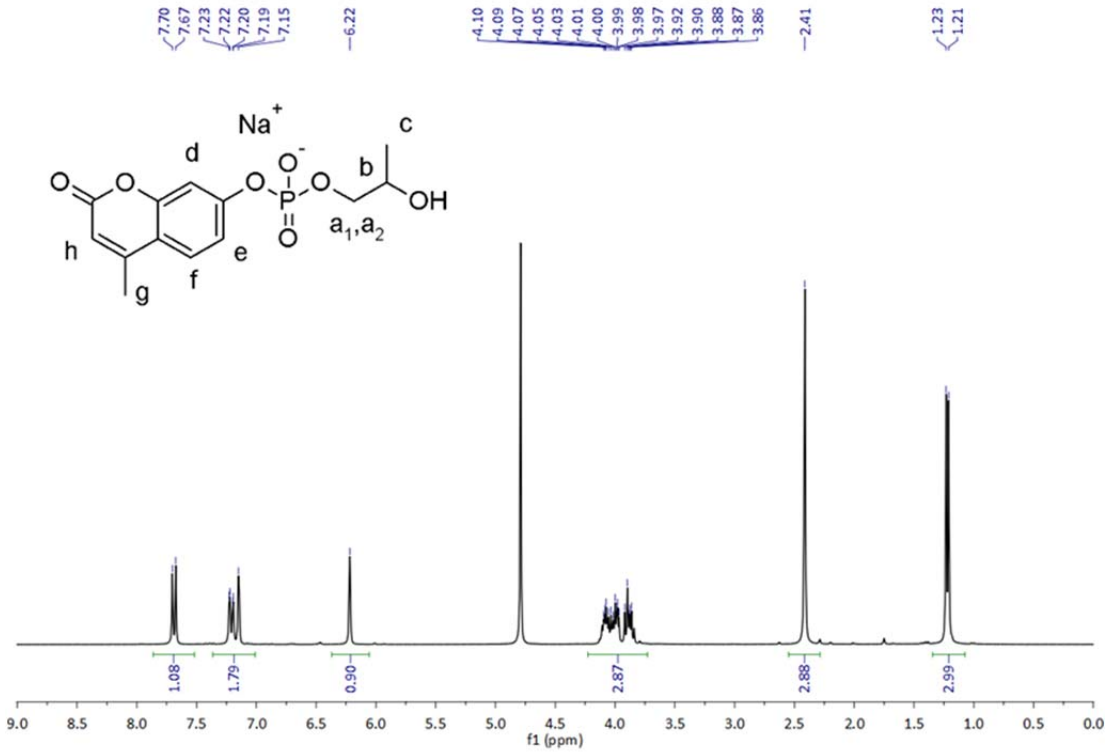


MS-ESI (-)

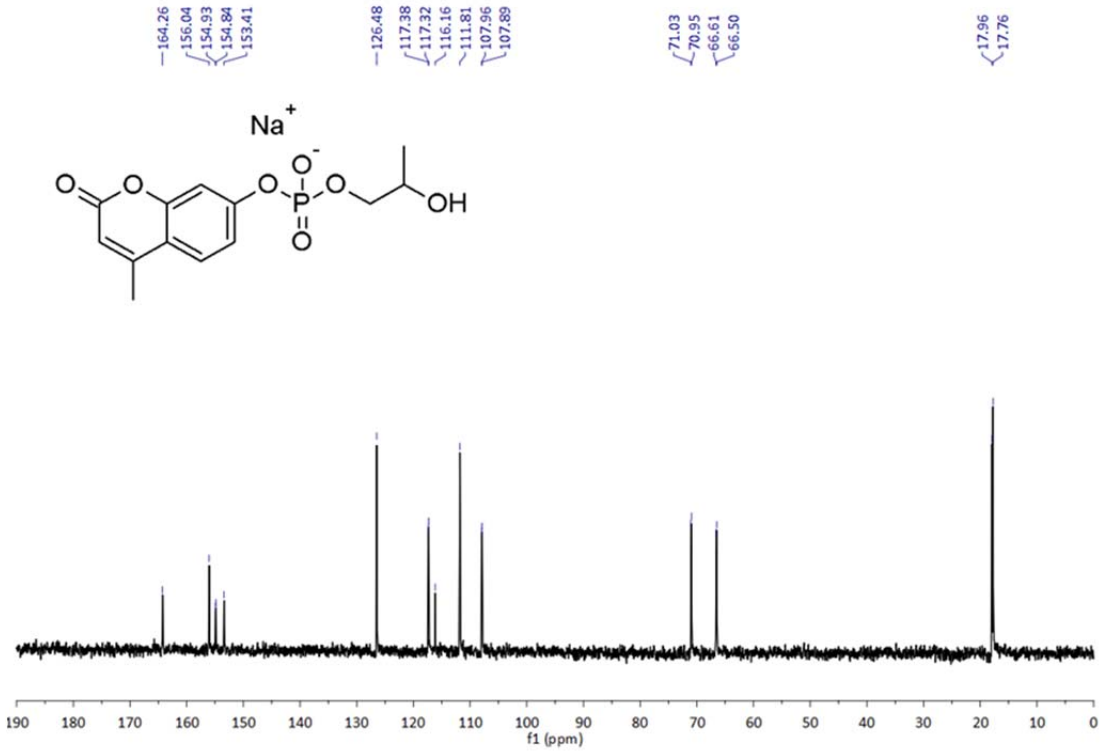


2-Hydroxypropyl 4-methylumbelliferyl phosphate, sodium (6)

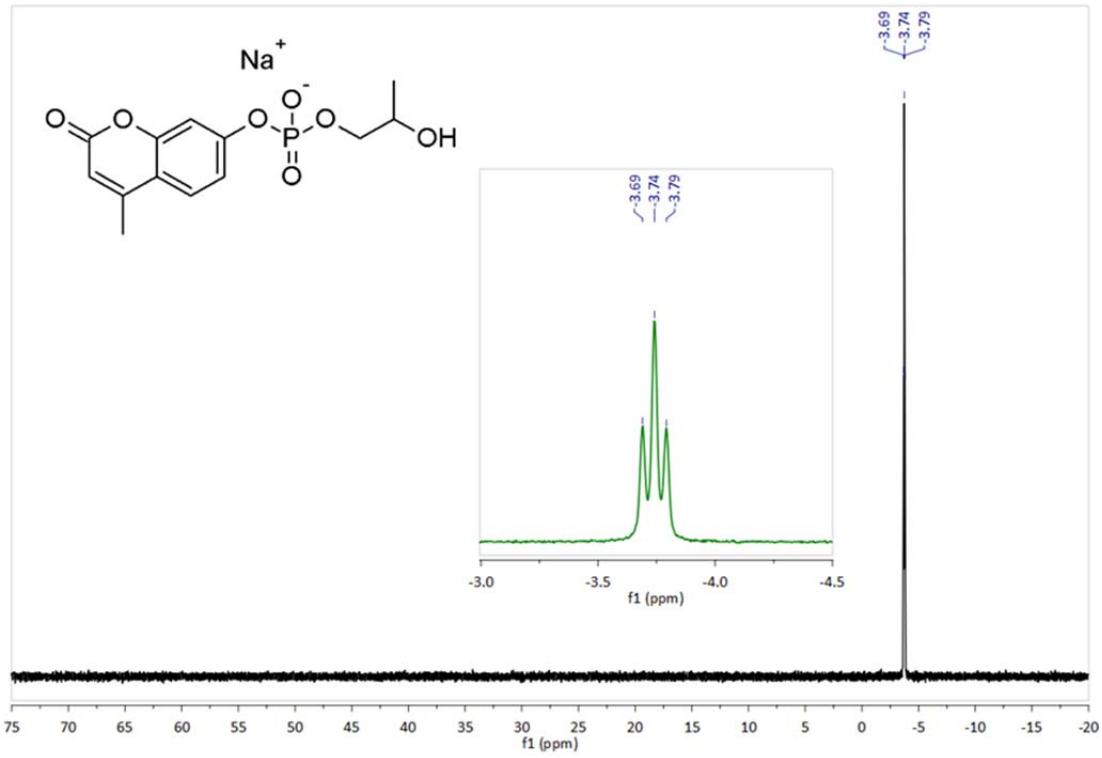
^{1}H-NMR (D_2O)



^{13}C-NMR (D_2O)



^{31}P-NMR (D_2O)



MS-ESI (-)