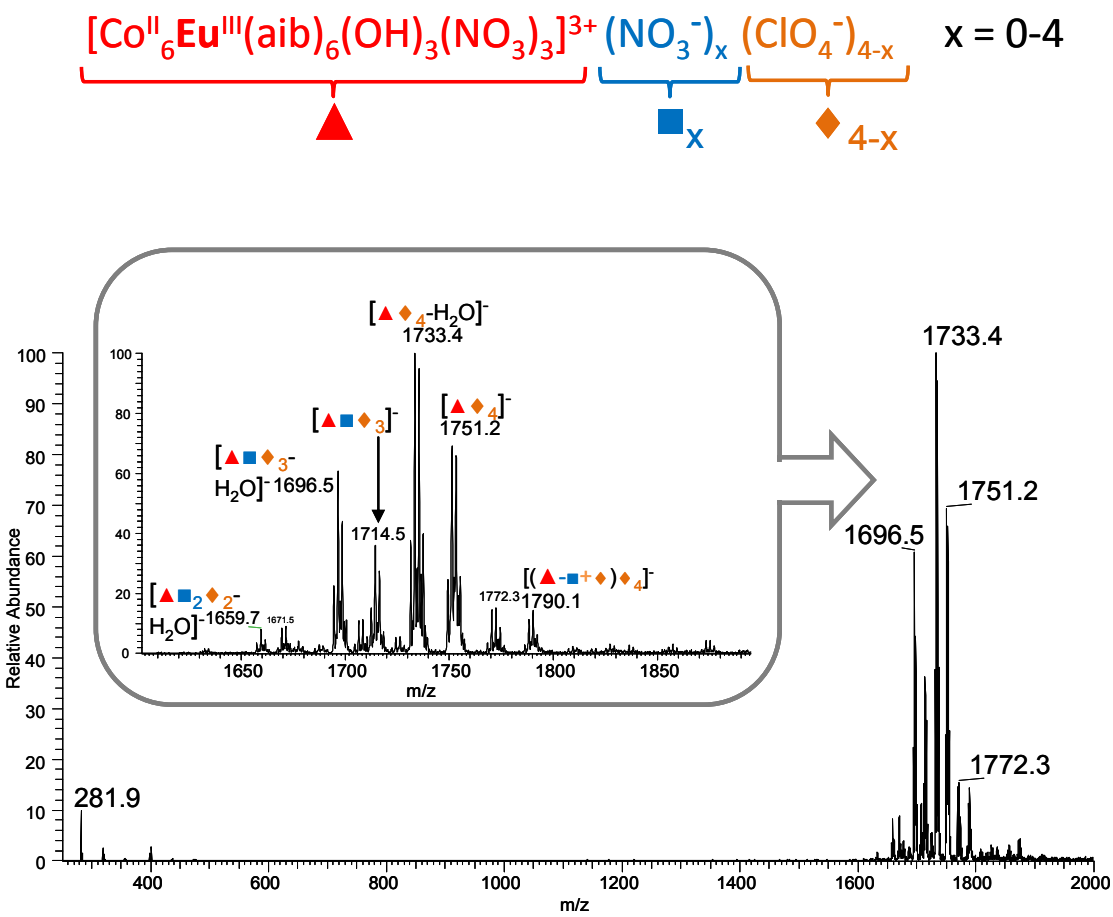

Figure S1. Negative ion electrospray mass spectrum for complex **1**. Insert depicts the molecular ion region and assignments.

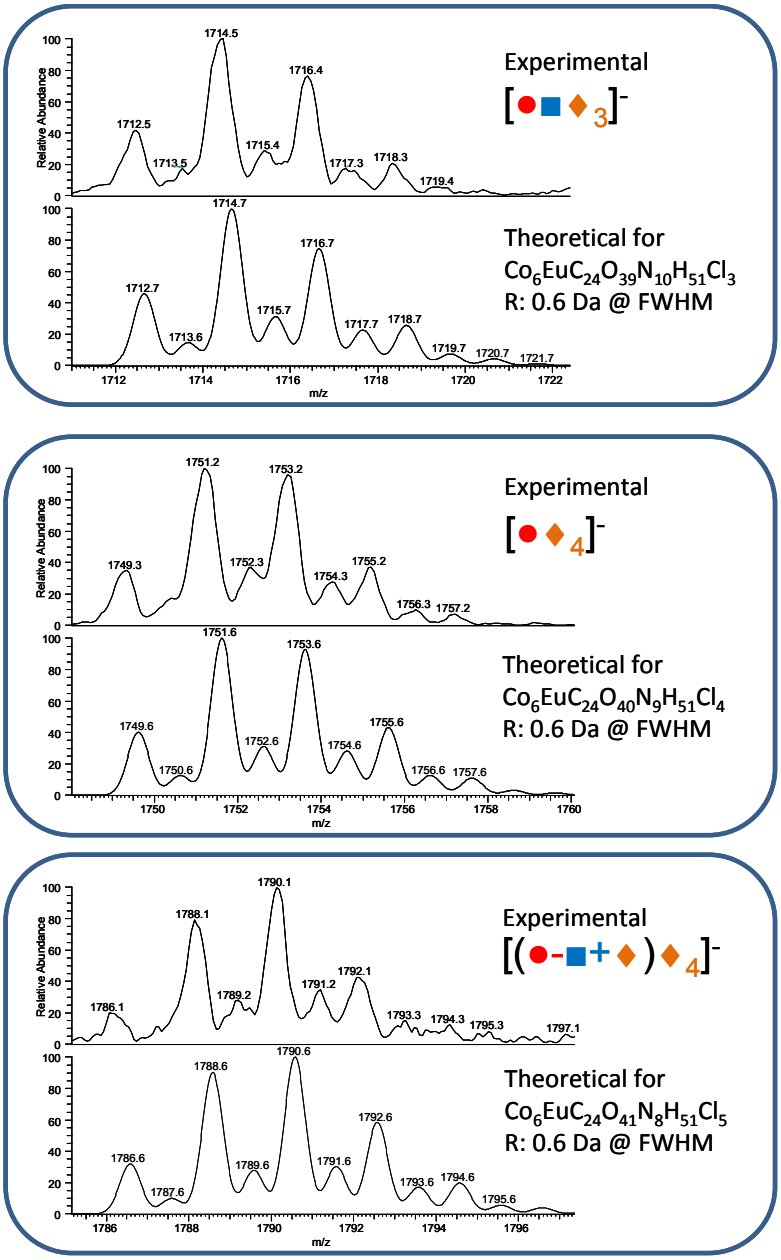

Figure S2. Comparison of experimental and theoretical isotopic patterns observed and determined for complex **1** under negative ion mass spectrometric conditions.

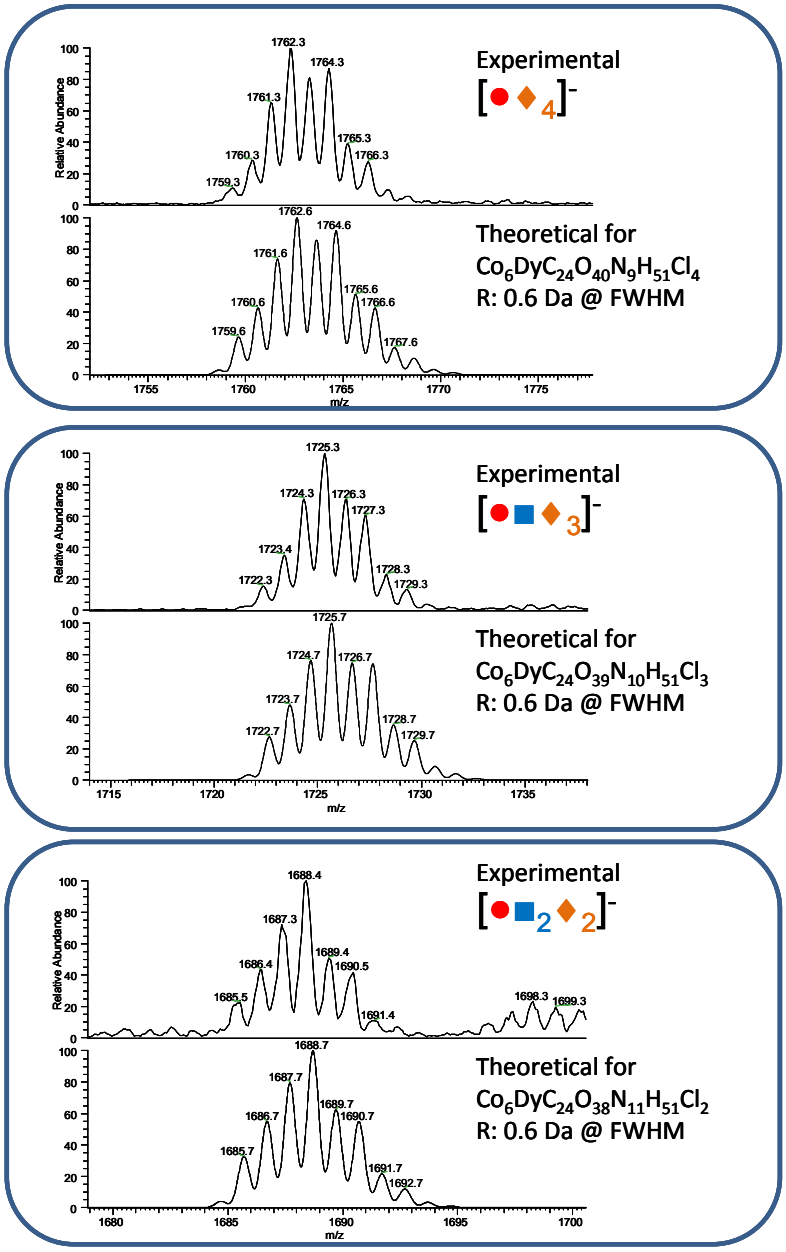

Figure S3. Comparison of experimental and theoretical isotopic patterns observed and determined for complex **2** under negative ion mass spectrometric conditions.

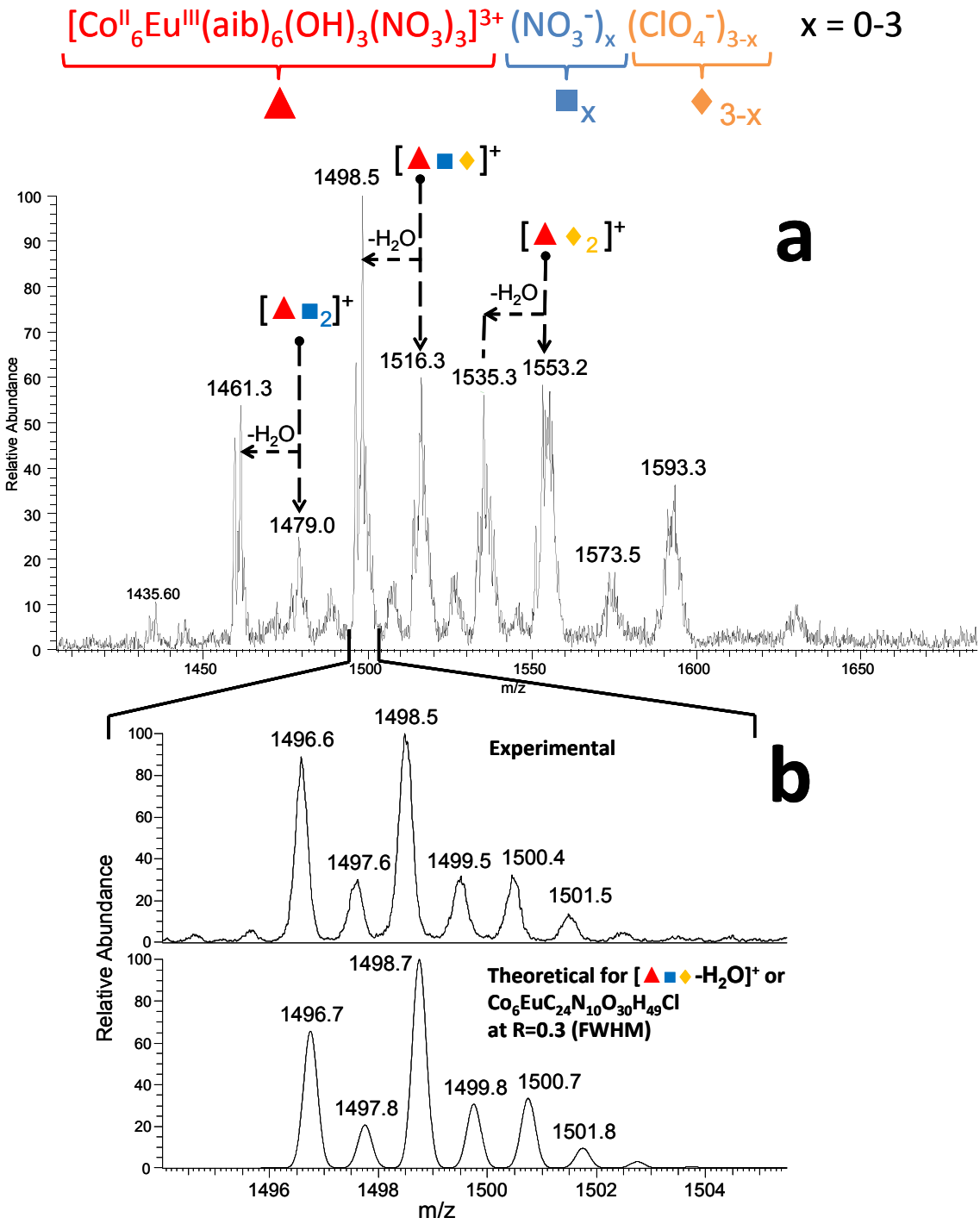

Figure S4. Positive ion electrospray mass spectrum for complex **1 (a)**. Comparison of experimental and theoretical isotopic pattern for [▲■♦ -H_2O]$^+$ **(b)**.

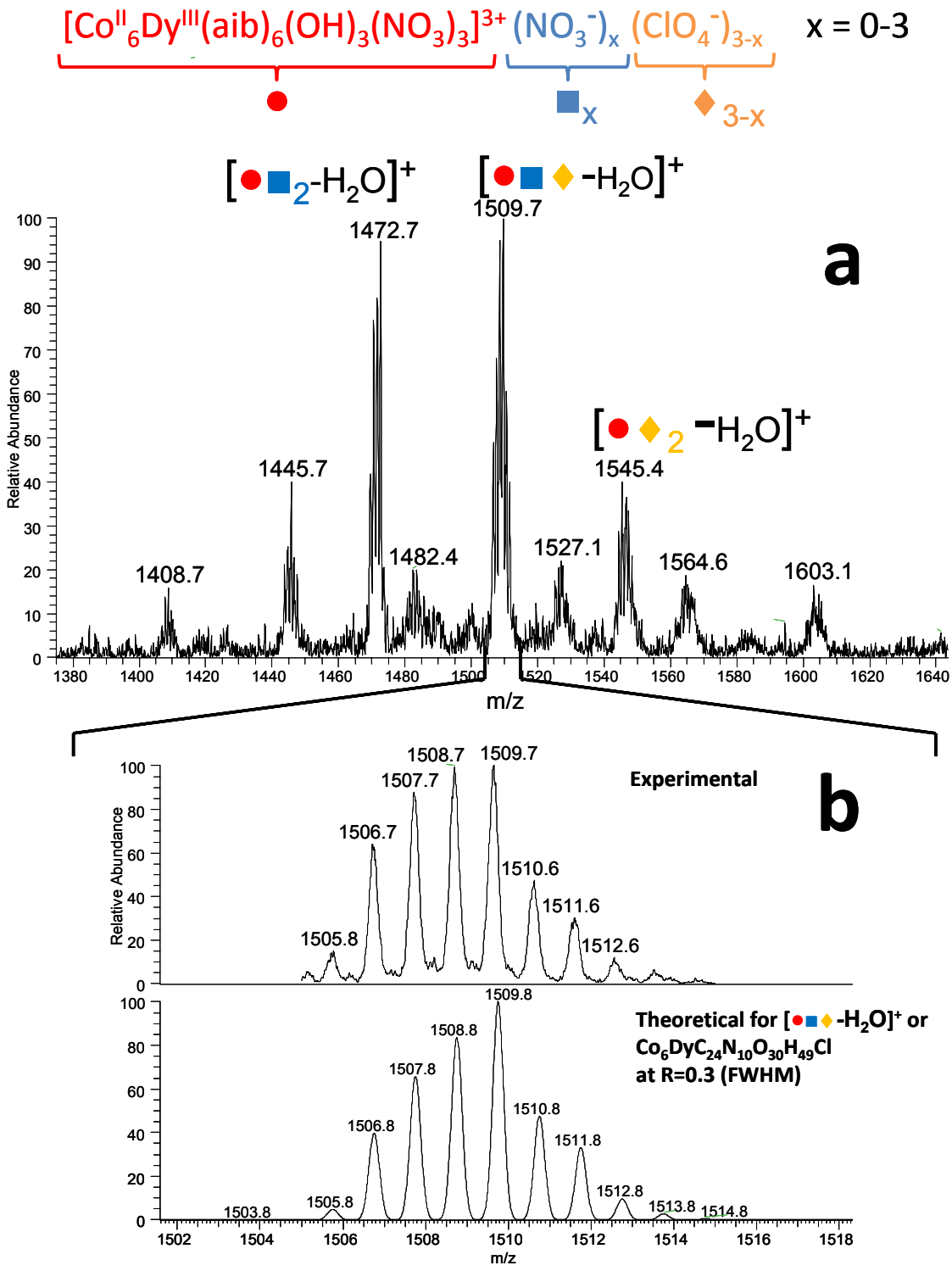

Figure S5. Positive ion electrospray mass spectrum for complex **2 (a)**. Comparison of experimental and theoretical isotopic pattern for [●■♦ -H_2O]$^+$ **(b)**.

Table S1 Crystallographic data for **1** and **2**

Compound reference	**1**	**2**
Chemical formula	$[Co_6Eu(C_4H_8NO_2)_6(OH)_3(NO_3)_3(CH_3OH)_{4.87}(H_2O)_{1.13}](ClO_4)_{2.5}(NO_3)_{0.5}$•2.43($CH_3OH$)• 0.92($H_2O$)	$[Co_6Dy(C_4H_8NO_2)_6(OH)_3(NO_3)_{2.9}(CH_3OH)_{4.92}(H_2O)_{1.18}](ClO_4)_{2.6}(NO_3)_{0.5}$•2.5($CH_3OH$)•0.5($H_2O$)
Formula Mass	1908.15	1916.00
Crystal system	Triclinic	Triclinic
a/ Å	13.178(3)	13.196(4)
b/ Å	13.694(3)	13.731(5)
c/ Å	22.121(5)	22.270(6)
α/°	86.75(3)	87.14(3)
β/°	81.62(3)	81.55(3)
γ/°	61.90(3)	62.18(4)
Unit cell volume/ Å ^{3}	3483.5(15)	3529.3(23)
Temperature/K	100(2)	100(2)
Space group	*P*-1	*P*-1
No. of formula units per unit cell, *Z*	2	2
Radiation type	MoKα	MoKα
Absorption coefficient, μ/mm^{-1}	2.481	2.622
No. of reflections measured	76504	47976
No. of independent reflections	37595	25494
R_{int}	0.0427	0.0282
Final R_1 values ($I > 2\sigma(I)$)	0.0563	0.0391
Final $wR(F^2)$ values ($I > 2\sigma(I)$)	0.1086	0.0971
Final R_1 values (all data)	0.1356	0.0578
Final $wR(F^2)$ values (all data)	0.1184	0.1009
Goodness of fit on F^2	1.011	1.053
CCDC number	807048	807049

All crystals were dried *in vacuo* and analysed as solvent free. Elemental Anal. Calcd (found) for **1**: C 19.21 (19.34), H 4.06 (3.92), N 7.34 (7.25); **2**: C 19.11 (19.22), H 3.98 (3.89), N 7.30 (7.22)

In complex cation **1** two of three NO_3^- ligands are disordered over two positions one with occupation factors 0.5/0.5 and the other with 0.78/0.22. Also some of coordinated methanol/water molecules are disordered. In two cases methanol molecules are partially replaced by water molecules (o3w/o3ma/o3mb and o5w/o5m with occupation factors 0.33/0.33/0.33 and 0.8./0.2).

Structure **2** shows similar disorder with only slightly differences in occupation factors. One of coordinate nitrate is partially replaced by water molecule (10%).

In both crystals all perchlorate anions are disordered. Furthermore the perchlorate anions containing Cl6 atom are cooperatively disordered with methanol molecules.