

## SUPPORTING INFORMATION

**Fig. 1 ESI** Low field region of the  $^1\text{H}$  NMR spectrum for  $[1\mathbf{a}]\text{Cl}$  in  $\text{CD}_3\text{OD}$  at 25 °C.

**Fig. 2 ESI**  $^1\text{H}$  NMR spectrum for  $[2\mathbf{a}]\text{Cl}$  in  $\text{CD}_3\text{SOCD}_3$  at 25 °C.

**Fig. 3 ESI**  $^1\text{H}$  NMR spectrum for  $[3\mathbf{a}]\text{Cl}$  in  $\text{CD}_3\text{SOCD}_3$  at 25 °C.

**Fig. 4 ESI** DSC curve for the *aphen*/DNA system at  $C_{\text{D}}/C_{\text{P}} = 1$ ,  $C_{\text{P}} = 4 \times 10^{-4}$  M,  $I = 2.5$  mM (NaCac), pH = 7, scan rate = 1 °C/min and P = 3 atm.

**Fig. 5 ESI** Aquation curve of  $[1\mathbf{a}]\text{Cl}$  at  $\lambda = 300$  nm,  $I = 2.5$  mM, pH = 6 and T = 25 °C.

**Fig. 6 ESI** Low field region of the  $^1\text{H}$  NMR spectra in  $\text{D}_2\text{O}$  ( $I = 0.1$  M) at 25 °C for reaction between  $[1\mathbf{a}]\text{Cl}$  and 9-MeG (1:1, 5 mM, pH = 6).

**Fig. 7 ESI** Low field region of the  $^1\text{H}$  NMR spectra in  $\text{D}_2\text{O}$  ( $I = 2.5$  mM) at 25 °C for the reaction between  $[1\mathbf{a}]\text{Cl}$  and 5'-dGMP (1:1, 5 mM, pH = 6).

**Fig. 8 ESI**  $^{31}\text{P}$  NMR spectra in  $\text{D}_2\text{O}$  ( $I = 2.5$  mM) at 25 °C for the reaction between  $[1\mathbf{a}]\text{Cl}$  and 5'-dGMP (1:1, 5 mM, pH = 6).

**Table 1 ESI.**  $^1\text{H}$  NMR Chemical shifts,  $\delta$  (ppm), for complexes  $[1\mathbf{a}]\text{Cl}$ ,  $[1\mathbf{a}](\text{BF}_4)$ ,  $[1\mathbf{b}]\text{Cl}$  and  $[1\mathbf{b}](\text{BF}_4)$ .

**Table 2 ESI.**  $^1\text{H}$  NMR Chemical shifts,  $\delta$  (ppm), for complexes  $[2\mathbf{a}]\text{Cl}$ ,  $[2\mathbf{a}](\text{BF}_4)$ ,  $[2\mathbf{b}]\text{Cl}$  and  $[2\mathbf{b}](\text{BF}_4)$ .

**Table 3 ESI.**  $^{13}\text{C}$  NMR Chemical shifts,  $\delta$  (ppm), for complexes  $[1\mathbf{a}]\text{Cl}$  and  $[1\mathbf{a}](\text{BF}_4)$ .

**Table 4 ESI.**  $^{13}\text{C}$  NMR Chemical shifts,  $\delta$  (ppm), for complexes  $[2\mathbf{a}]\text{Cl}$ ,  $[2\mathbf{a}](\text{BF}_4)$ ,  $[2\mathbf{b}]\text{Cl}$  and  $[2\mathbf{b}](\text{BF}_4)$ .

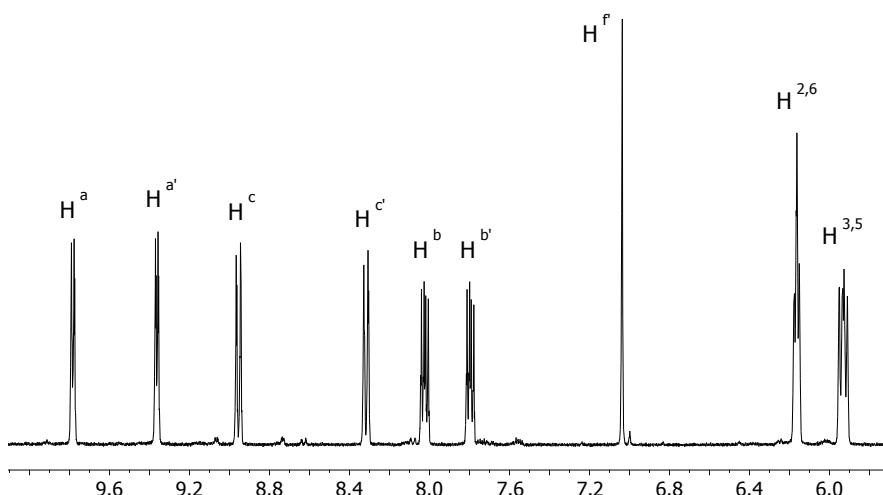
**Table 5 ESI.**  $^1\text{H}$  NMR Chemical shifts,  $\delta$  (ppm), for complex  $[3\mathbf{a}]\text{Cl}$ .

**Table 6 ESI.**  $^{13}\text{C}$  NMR Chemical shifts,  $\delta$  (ppm), for complex  $[3\mathbf{a}]\text{Cl}$ .

**Table 7 ESI.** Molar conductivity,  $\Lambda_M$  ( $\text{S}\cdot\text{cm}^2\cdot\text{mol}^{-1}$ ), for all complexes.

**Table 8 ESI.** Crystal data and structure refinement for  $[2\mathbf{a}](\text{BF}_4)$ .

**Table 9 ESI.** Some Intermolecular hydrogen bonding parameters for complex  $[2\mathbf{a}](\text{BF}_4)$ .



**Fig. 1 ESI** Low field region of the  $^1\text{H}$  NMR spectrum for  $[1\mathbf{a}]\text{Cl}$  in  $\text{CD}_3\text{OD}$  at 25 °C.

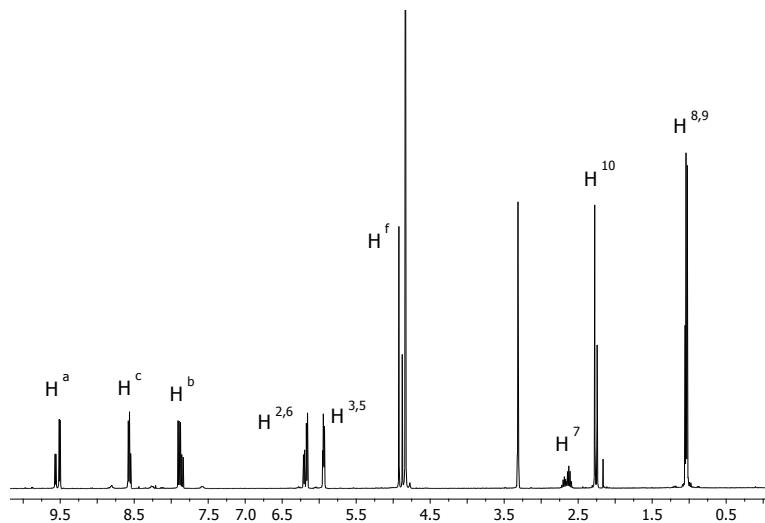


Fig. 2 ESI <sup>1</sup>H NMR spectrum for [2a]Cl in CD<sub>3</sub>SOCD<sub>3</sub> at 25 °C.

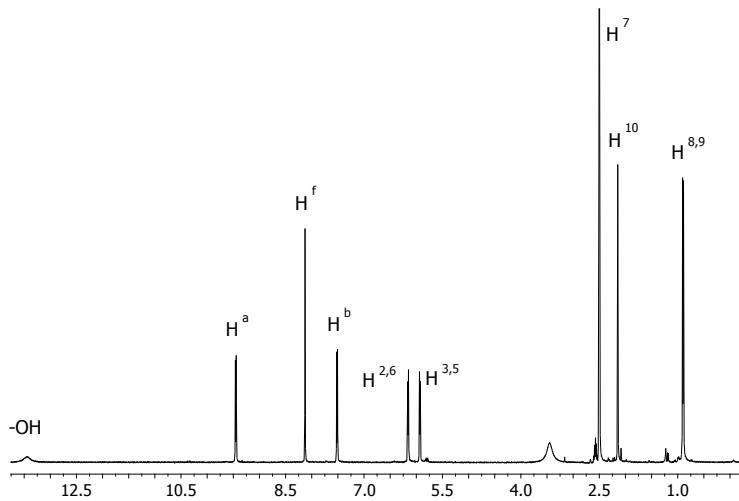


Fig. 3 ESI <sup>1</sup>H NMR spectrum for [3a]Cl in CD<sub>3</sub>SOCD<sub>3</sub> at 25 °C.

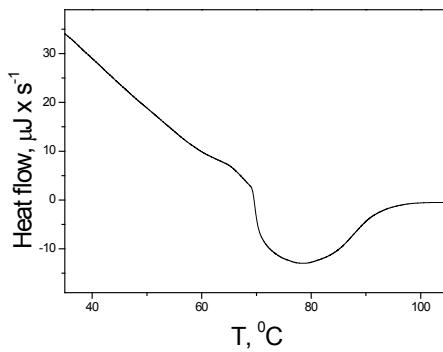
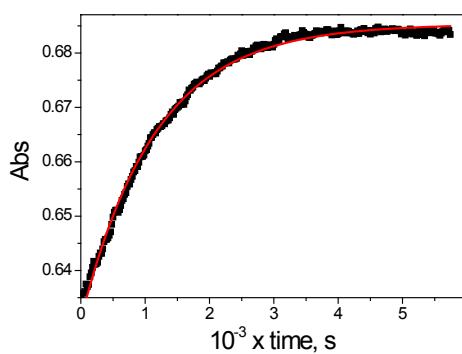
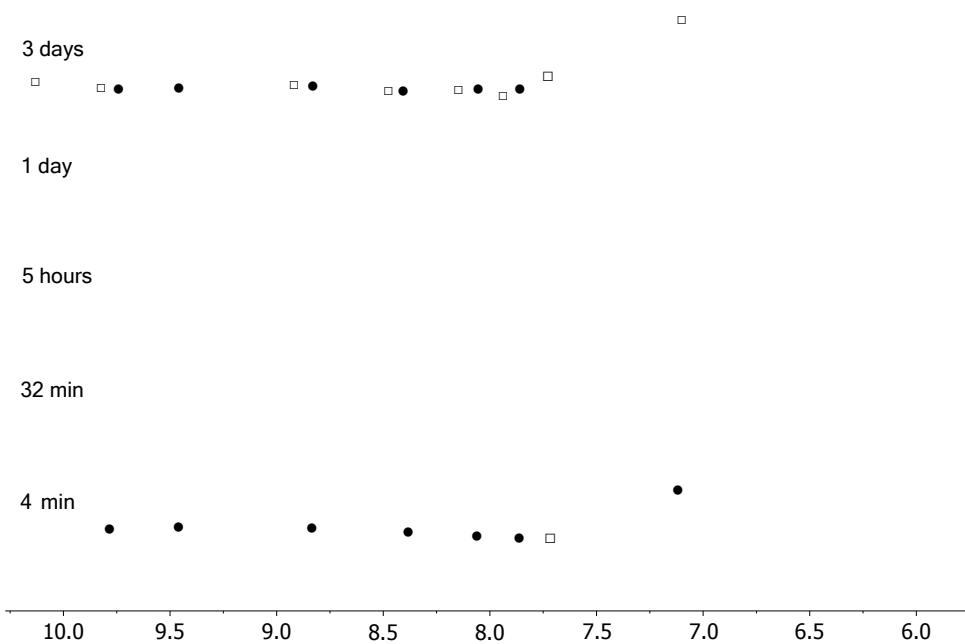


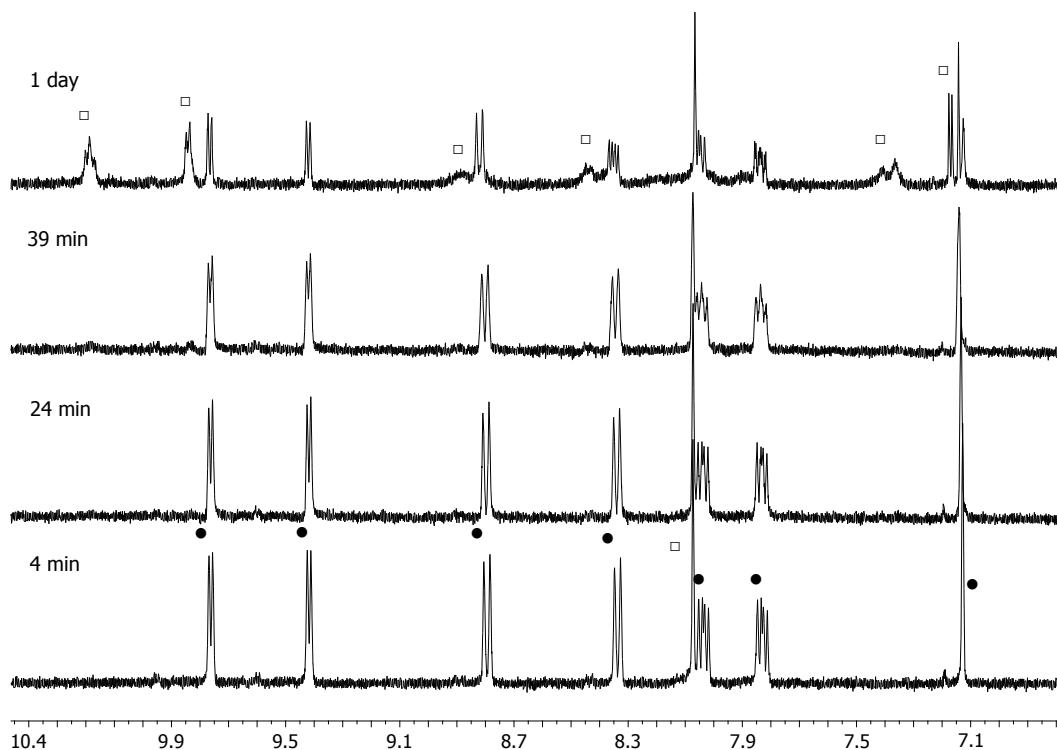
Fig. 4 ESI DSC curve for the *aphen*/DNA system at C<sub>D</sub>/C<sub>P</sub> = 1, C<sub>P</sub> = 4 × 10<sup>-4</sup> M, I = 2.5 mM, pH = 7, scan rate 1 °C/min and P = 3 atm.



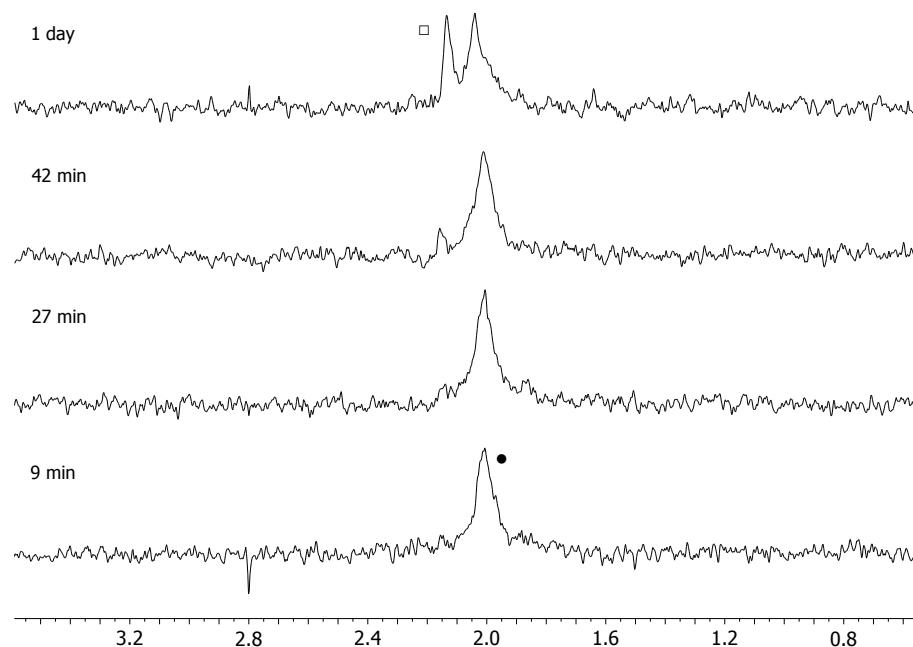
**Fig. 5** ESI Aquation curve of **[1a]Cl** at  $\lambda = 300$  nm,  $I = 2.5$  mM,  $pH = 6$  and  $T = 25$  °C.,



**Fig. 6** ESI Low field region of the  $^1\text{H}$  NMR spectra in  $\text{D}_2\text{O}$  ( $I = 0.1$  M) at  $25$  °C for reaction between **[1a]Cl** and 9-MeG (1:1, 5 mM, pH = 6). (● = Ru-Cl, ▲ = 9-MeG, ■ = adduct Ru-N7).



**Fig. 7** ESI Low field region of the  $^1\text{H}$  NMR spectra in  $\text{D}_2\text{O}$  ( $I = 0.1 \text{ M}$ ) at  $25^\circ\text{C}$  for the reaction between  $[1\text{a}]\text{Cl}$  and 5'-dGMP (1:1, 5 mM, pH = 6). (● = Ru-Cl, ▲ = 5'-dGMP, ■ = adduct Ru-N7).



**Fig. 8** ESI  $^{31}\text{P}$  NMR spectra in  $\text{D}_2\text{O}$  ( $I = 0.1 \text{ M}$ ) at  $25^\circ\text{C}$  for the reaction between  $[1\text{a}]\text{Cl}$  and 5'-dGMP (1:1, 5 mM, pH = 6). (● = 5'-dGMP, ▲ = adduct Ru-N7).

**Table 1 ESI**  $^1\text{H}$  NMR Chemical shifts,  $\delta$  (ppm), for complexes [1a]Cl, [1a](BF<sub>4</sub>), [1b]Cl and [1b](BF<sub>4</sub>).

Compounds	<i>Aphen</i>							<i>p-cym/bz</i>				
	H <sup>a</sup> (dd)	H <sup>a</sup> (dd)	H <sup>c</sup> (dd)	H <sup>c</sup> (dd)	H <sup>b</sup> (dd)	H <sup>b</sup> (dd)	H <sup>f</sup> (s)	H <sup>2,6</sup> (m)	H <sup>3,5</sup> (m)	H <sup>7</sup> (sept)	H <sup>10</sup> (s)	H <sup>8,9</sup> (d)
[1a]Cl	9.78	9.36	8.96	8.32	8.02	7.79	7.04	6.16	5.93	2.62	2.26	0.97
[1a](BF <sub>4</sub> )	9.78	9.36	8.95	8.32	8.02	7.79	7.04	6.16	5.92	2.62	2.26	0.97
[1b]Cl	9.86	9.44	8.95	8.31	8.01	7.78	7.03	6.22 <sup>c</sup>				
[1b](BF <sub>4</sub> )	9.86	9.44	8.95	8.32	8.01	7.79	7.05	6.18				

<sup>c</sup> Just one singlet for the 6 protons of **bz**.

**Table 2 ESI**  $^1\text{H}$  NMR Chemical shifts,  $\delta$  (ppm), for complexes [2a]Cl, [2a](BF<sub>4</sub>), [2b]Cl and [2b](BF<sub>4</sub>).

ephen region	H <sup>aM</sup>	H <sup>am</sup>	H <sup>cM</sup>	H <sup>cm</sup>	H <sup>5M</sup>	H <sup>bm</sup>
<i>ephen</i>	8.80 dd	-	8.21 dd	-	7.54 dd	-
[2a]Cl	9.51 dd	9.56 dd	8.57 dd	8.55 dd	7.89 dd	7.85 dd
[2a](BF <sub>4</sub> )	9.46 dd	9.51 dd	8.56 dd	8.55 dd	7.88 dd	7.85 dd
[2b]Cl	9.56 dd	9.60 dd	8.56 dd	8.54 dd	7.87 dd	7.82 dd
[2b](BF <sub>4</sub> )	9.56 dd	9.60 dd	8.56 dd	8.55 dd	7.87 dd	7.83 dd

aromatic region	H <sup>2,6M</sup>	H <sup>2,6m</sup>	H <sup>3,5M</sup>	H <sup>3,5m</sup>	H <sup>7M</sup>	H <sup>7m</sup>
<i>ephen</i>					4.74 s	
[2a]Cl	6.16 d	6.20 d	5.93 d	5.94 d	4.92 s	4.87 s
[2a](BF <sub>4</sub> )	6.12 d	6.16 d	5.90 d	5.90 d	4.91 s	4.91 s
[2b]Cl	6.18 s *	6.19 s *	----	----	4.91 s	4.86 s
[2b](BF <sub>4</sub> )	6.18 s *	6.19 s *	----	----	4.91 s	4.86 s

\* Just one singlet for the 6 protons of **bz**.

p-cym region	H <sup>7M</sup>	H <sup>7m</sup>	H <sup>10M</sup>	H <sup>10m</sup>	H <sup>8,9M</sup>	H <sup>8,9m</sup>
[2a]Cl	2.62 sept	2.68 sept	2.27 s	2.24 s	1.03 d	1.04 d
[2a](BF <sub>4</sub> )	2.62 sept	2.68 sept	2.27 s	2.24 s	1.04 d	1.04 d

Note: M and m refer to major and minor isomers, respectively.

**Table 3 ESI**  $^{13}\text{C}$  NMR Chemical shifts,  $\delta$  (ppm), for complexes [1a]Cl and [1a](BF<sub>4</sub>).

	aphen region											
	C <sup>a</sup> (s)	C <sup>a</sup> (s)	C <sup>e</sup> (s)	C <sup>f</sup> (s)	C <sup>e</sup> (s)	C <sup>c</sup> (s)	C <sup>c</sup> (s)	C <sup>d</sup> (s)	C <sup>b</sup> (s)	C <sup>b</sup> (s)	C <sup>d</sup> (s)	C <sup>f</sup> (s)
[1a]Cl	156.46	151.48	147.90	146.25	141.26	136.35	134.98	134.31	127.22	125.97	125.17	103.04
[1a](BF <sub>4</sub> )	156.47	151.50	147.90	146.24	141.26	136.35	134.96	134.30	127.23	125.98	125.17	103.06
p-cym region												
	C <sup>1</sup> (s)	C <sup>4</sup> (s)	C <sup>2</sup> (s)	C <sup>6</sup> (s)	C <sup>3'</sup> (s)	C <sup>5</sup> (s)	C <sup>7</sup> (s)	C <sup>8,9</sup> (s)	C <sup>10</sup> (s)			
[1a]Cl	105.65	104.91	87.71	87.45	85.38	85.13	32.34	22.20	18.90			
[1a](BF <sub>4</sub> )	105.65	104.93	87.72	87.45	85.37	85.13	32.34	22.19	18.89			

**Table 4 ESI**  $^{13}\text{C}$  NMR Chemical shifts,  $\delta$  (ppm), for complexes [2a]Cl, [2a](BF<sub>4</sub>), [2b]Cl and [2b](BF<sub>4</sub>).

Isomer M	C <sup>a</sup>	C <sup>e</sup>	C <sup>c</sup>	C <sup>d</sup>	C <sup>b</sup>	C <sup>1</sup>	C <sup>4</sup>	C <sup>2,6</sup>	C <sup>3,5</sup>	C <sup>f</sup>	C <sup>7</sup>	C <sup>8,9</sup>	C <sup>10</sup>
[2a]Cl	156.65	151.57	141.91	134.85	129.02	106.24	105.34	87.46	85.40	55.90	32.40	22.29	18.96
[2a](BF <sub>4</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---
[2b]Cl	156.66	151.84	142.02	134.83	128.82	88.25*	---	---	---	55.89	---	---	---
[2b](BF <sub>4</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---
Isomer m	C <sup>a</sup>	C <sup>e</sup>	C <sup>c</sup>	C <sup>d</sup>	C <sup>b</sup>	C <sup>1</sup>	C <sup>4</sup>	C <sup>2,6</sup>	C <sup>3,5</sup>	C <sup>f</sup>	C <sup>7</sup>	C <sup>8,9</sup>	C <sup>10</sup>
[2a]Cl	156.32	151.91	142.00	135.17	128.68	106.61	105.28	88.02	85.38	55.62	32.29	22.32	18.91
[2a](BF <sub>4</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---
[2b]Cl	156.35	152.17	142.06	135.22	128.42	88.40*	---	---	---	55.55	---	---	---
[2b](BF <sub>4</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---

\* Just one singlet for the 6 C atoms of **bz**.

Note: M and m refer to major and minor isomers, respectively.

**Table 5 ESI**  $^1\text{H}$  NMR Chemical shifts,  $\delta$  (ppm), for complex [3a]Cl.

	$\text{H}_{(\text{OH})}$	$\text{H}^{\text{a}}$	$\text{H}^{\text{f}}$	$\text{H}^{\text{b}}$	$\text{H}^{2,6}$	$\text{H}^{3,5}$	$\text{H}^7$	$\text{H}^{10}$	$\text{H}^{8,9}$
DMSO	13.45	9.45 d	8.13 s	7.51 d	6.16 d	5.93 d	2.57 <sub>sept</sub>	2.15 s	0.90 d
$\text{CD}_3\text{OD}$	9.37 d	8.22 s	7.32 d	6.08 d	5.84 d	2.61 <sub>sept</sub>	2.24 s	0.98 d	

**Table 6 ESI**  $^{13}\text{C}$  NMR Chemical shifts,  $\delta$  (ppm), for complex [3a]Cl.

	$\text{C}^{\text{c}}$	$\text{C}^{\text{a}}$	$\text{C}^{\text{e}}$	$\text{C}^{\text{d}}$	$\text{C}^{\text{f}}$	$\text{C}^{\text{b}}$	$\text{C}^1$	$\text{C}^4$	$\text{C}^{2,6}$	$\text{C}^{3,5}$	$\text{C}^7$	$\text{C}^{8,9}$	$\text{C}^{10}$
[3a]Cl	165.29	157.01	148.54	123.81	121.23	111.32	104.41	103.90	86.66	84.29	32.30	22.24	18.93

**Table 7 ESI** Molar conductivity,  $\Lambda_M$  ( $\text{S}\cdot\text{cm}^2\cdot\text{mol}^{-1}$ ), for all complexes.

	$\text{H}_2\text{O}$	$\text{CH}_3\text{CN}$
[1a]Cl	90	
[1a](BF <sub>4</sub> )		98
[1b]Cl	91	
[1b](BF <sub>4</sub> )		113
[2a]Cl	74	
[2a](BF <sub>4</sub> )	65	
[2b]Cl		78
[2b](BF <sub>4</sub> )	96	
[3a]Cl	89	

**Table 8 ESI** Crystal data and structure refinement for [2a](BF<sub>4</sub>).

Empirical formula	$\text{C}_{22}\text{H}_{22}\text{BClF}_4\text{N}_2\text{ORu}$
Formula weight	553.75
Temperature (K)	298(2)
Wavelength (Å)	0.71073
Crystal system	Monoclinic
Space group	P2 <sub>1</sub> /c
a(Å)	17.274(6)
b(Å)	16.130(6)
c(Å)	16.903(6)
$\beta(^{\circ})$	96.644(5)
Volume(Å <sup>3</sup> )	4678(3)
Z	8
Density (calculated) (g/cm <sup>3</sup> )	1.572
Absorption coefficient (mm <sup>-1</sup> )	0.833
F(000)	2224
Crystal size (mm <sup>3</sup> )	0.41 x 0.41 x 0.32
Index ranges	-20 ≤ h ≤ 20 -19 ≤ k ≤ 19 -20 ≤ l ≤ 20
Reflections collected	43230
Independent reflections	8237 [R(int) = 0.1085]
Data / restraints / parameters	8237 / 54 / 621
Goodness-of-fit on F <sup>2</sup>	1.026
Final R indices [ $I > 2\sigma(I)$ ]	R1 = 0.0591, wR2 = 0.1517
Largest diff. peak and hole, e.Å <sup>-3</sup>	1.577 and -0.900

<sup>a</sup>  $R = \sum ||F_o| - |F_c|| / \sum |F_o|$ . <sup>b</sup>  $wR = \{\sum w(F_o^2 - F_c^2)^2 / \sum w(F_o^2)^2\}^{1/2}$ . <sup>c</sup> GOF =  $\{\sum [w((F_o^2 - F_c^2)^2)] / (n-p)\}^{1/2}$ , where n = number of reflections and p = total number of parameters refined.

**Table 9 ESI** Some Intermolecular hydrogen bonding parameters for complex **[2a](BF<sub>4</sub>)**.<sup>[a]</sup>

Interaction	d(D---A) Å	d(H---A) Å	d(D-H) Å	D-H---A (°)	Bond strength <sup>[b]</sup>
C5-H5---F7	3.238	2.313	0.980	156.97	weak
C6-H6---Cl2	3.615	2.698	0.980	156.07	weak
C36-H36---F3	3.073	2.144	0.978	157.95	strong
C35-H35---Cl1	3.687	2.771	0.980	155.86	weak
C32-H32---F6	3.411	2.591	0.931	147.34	weak
C31-H31---F5	3.356	2.546	0.929	145.88	weak
C47-H47---F8	3.429	2.637	0.929	143.50	weak
O3-H2(O3)---F7	3.343	2.600	0.817	151.81	weak
C19-H19C---O1	3.320	2.613	0.959	130.79	weak
C22-H22C---O1	3.628	2.695	0.959	164.48	weak
C49-H49B---O2	3.397	2.698	0.959	130.20	weak

[a] Calculated with Mercury, versión 3.0. [b] Bond strength according to Steiner [\*].

[\*]T. Steiner, *Angew. Chem.-Int. Edit.*, 2002, **41**, 48-76.