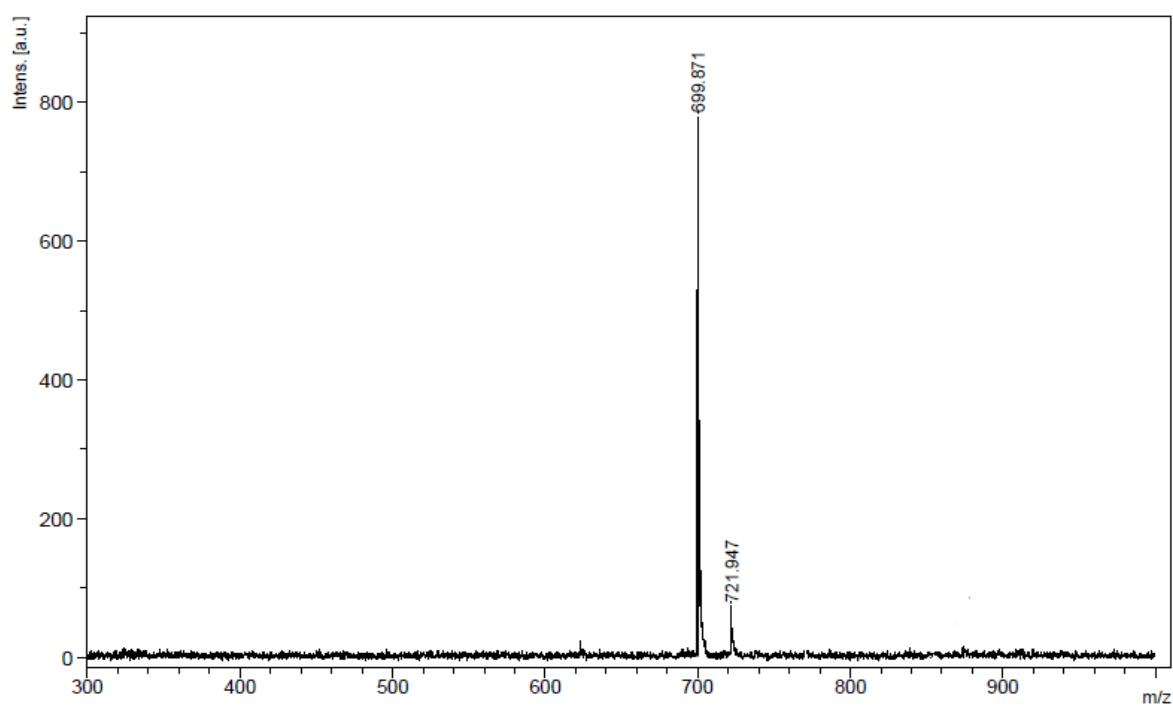


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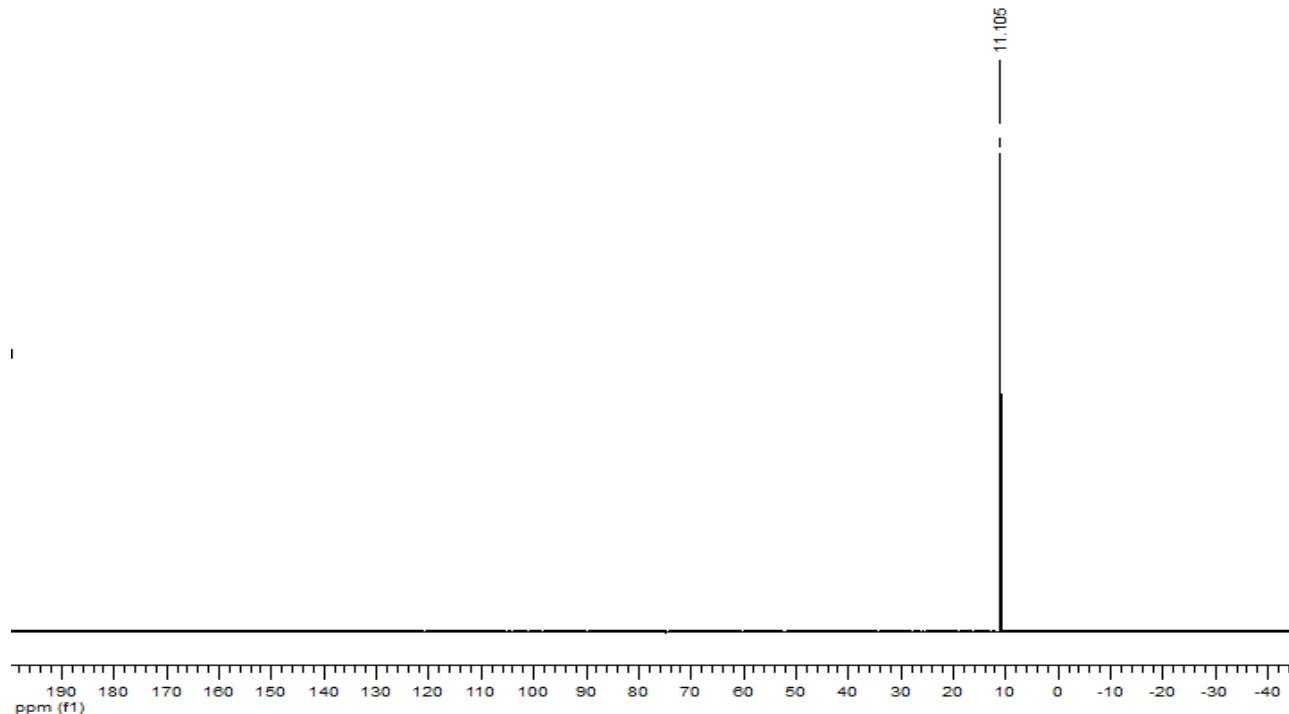
**Supporting information for article:**

**Silver(I) coordination polymers assembled from flexible cyclotriphosphazene ligand: structures, topologies, and investigation of the counteranion effects**

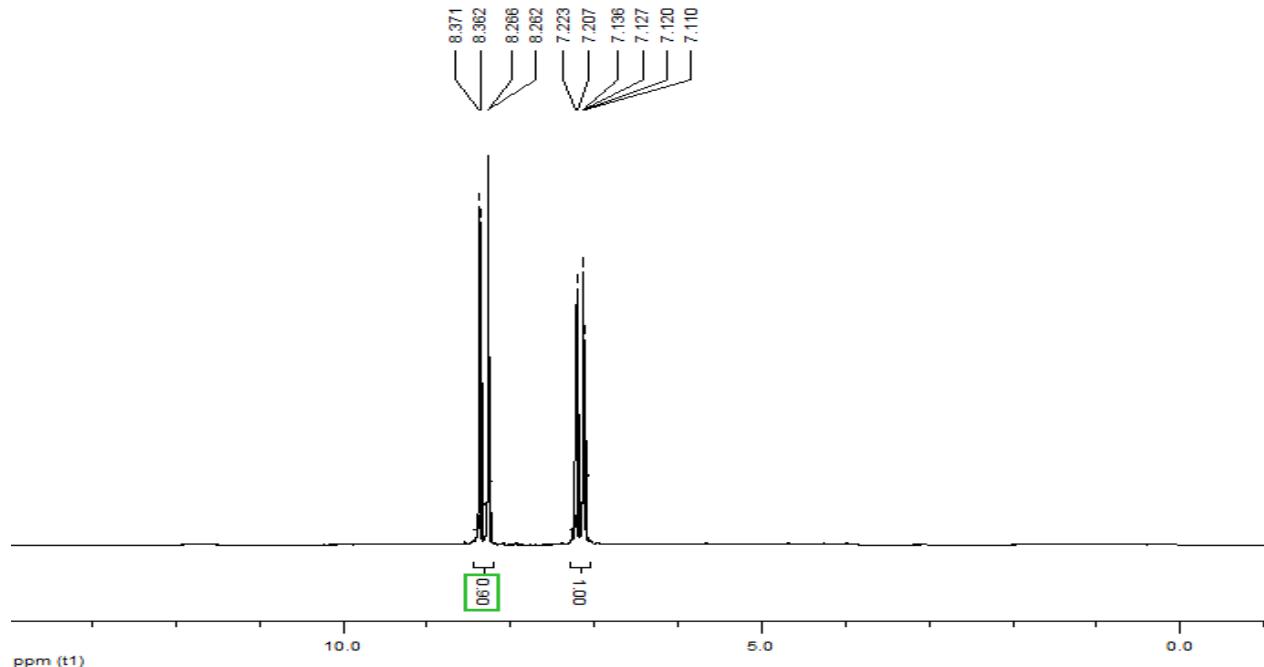
**Derya Davarci, Rüştü Gür, Serap Besli, Elif Senkuytu and Yunus Zorlu**



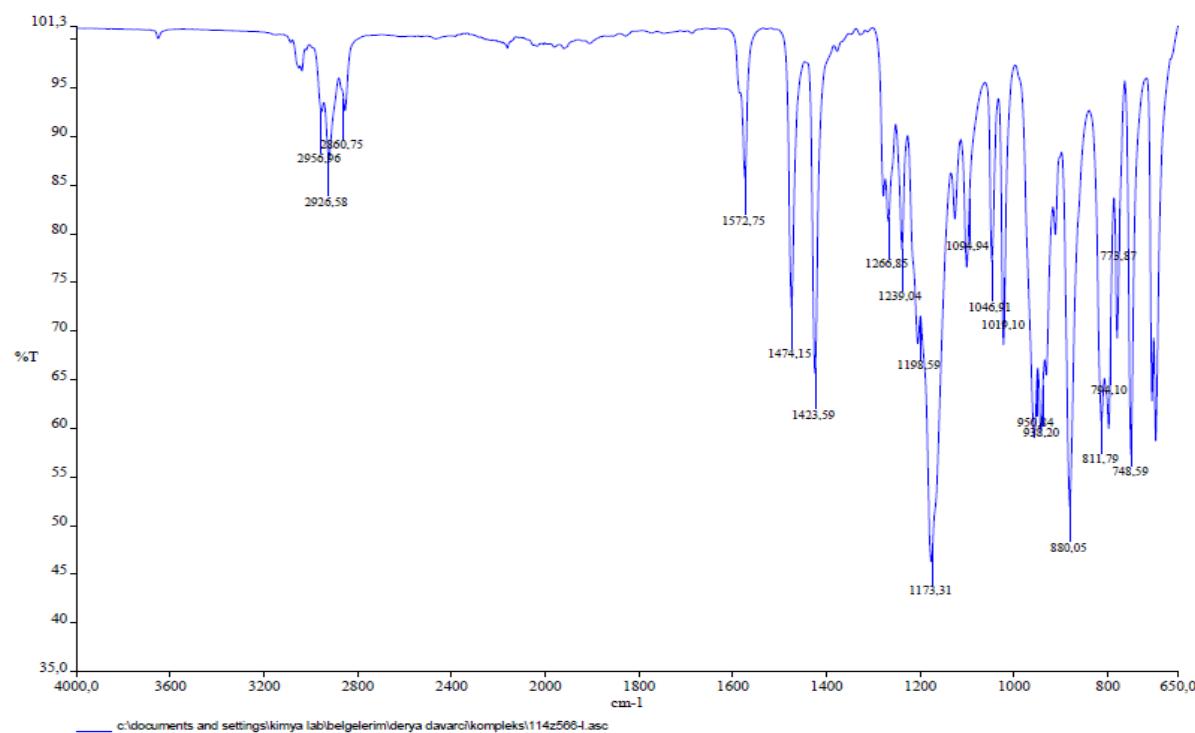
**Figure S1** Mass Analysis of HPCP.



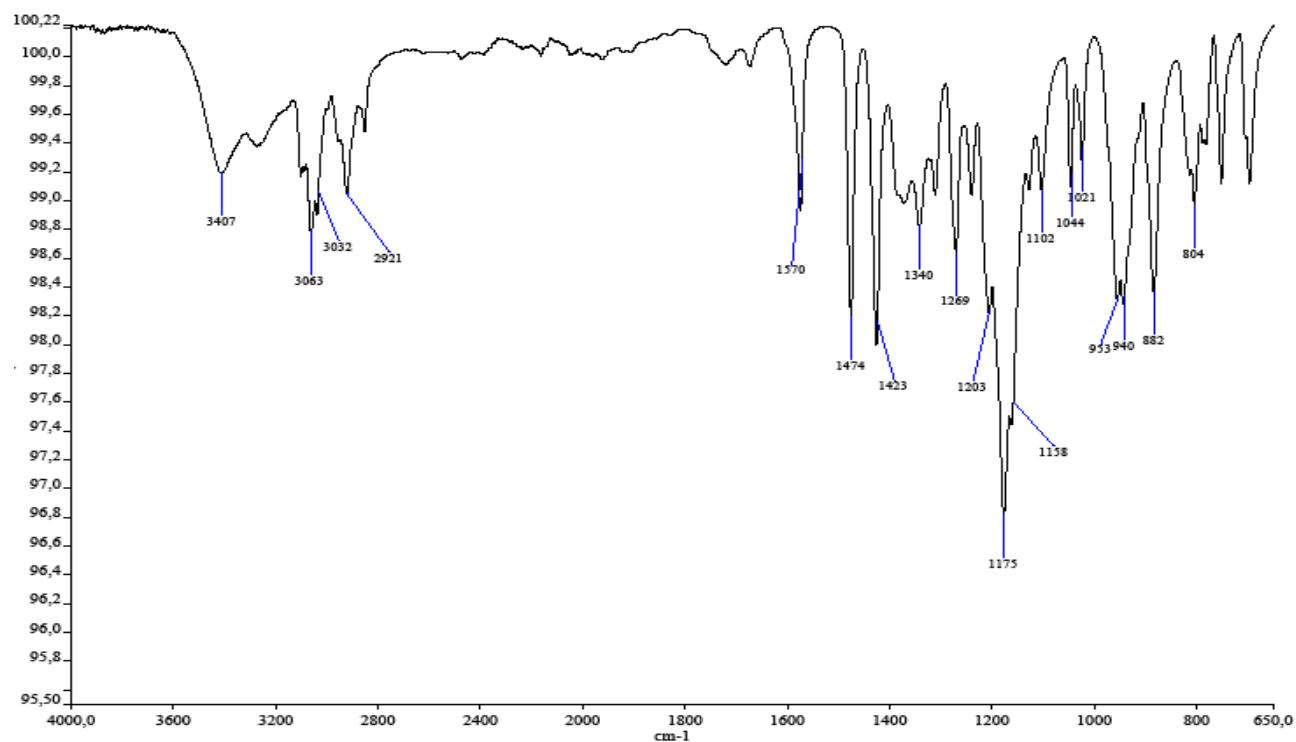
**Figure S2**  $^{31}\text{P}$  NMR spectrum of HPCP.



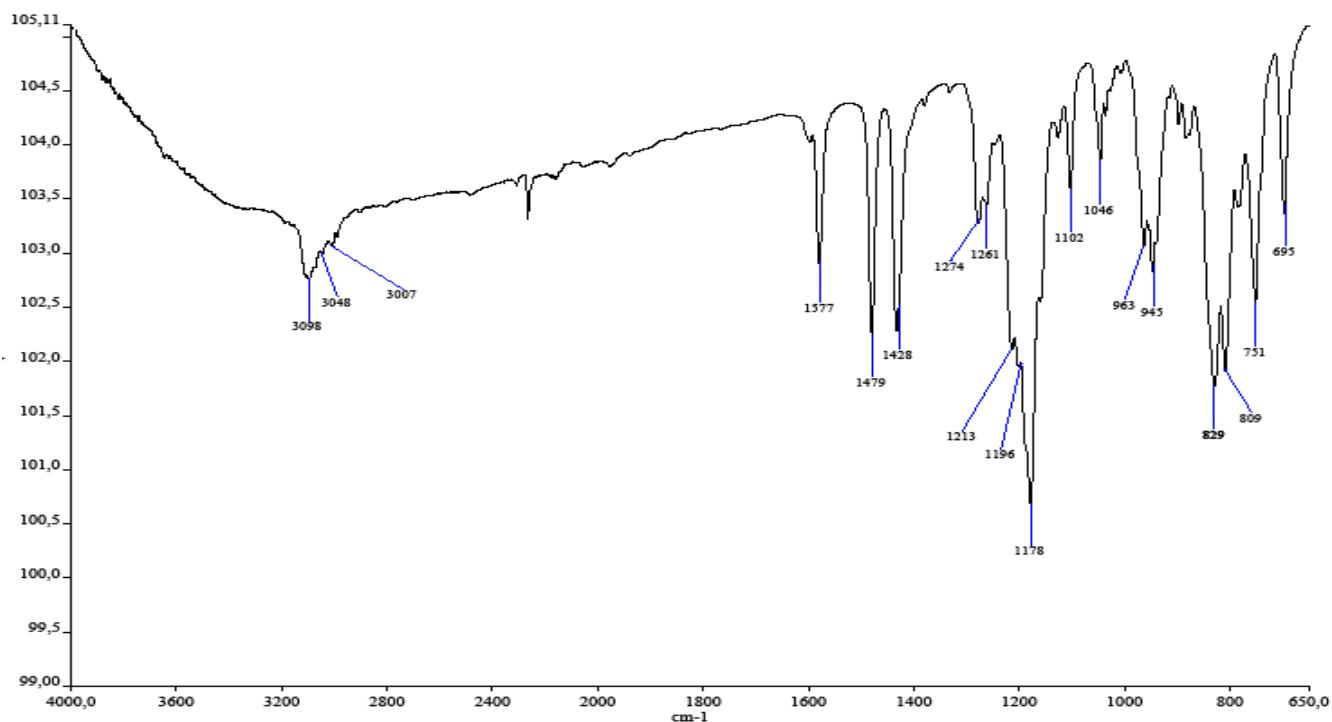
**Figure S3** <sup>1</sup>H NMR spectrum of HPCP.



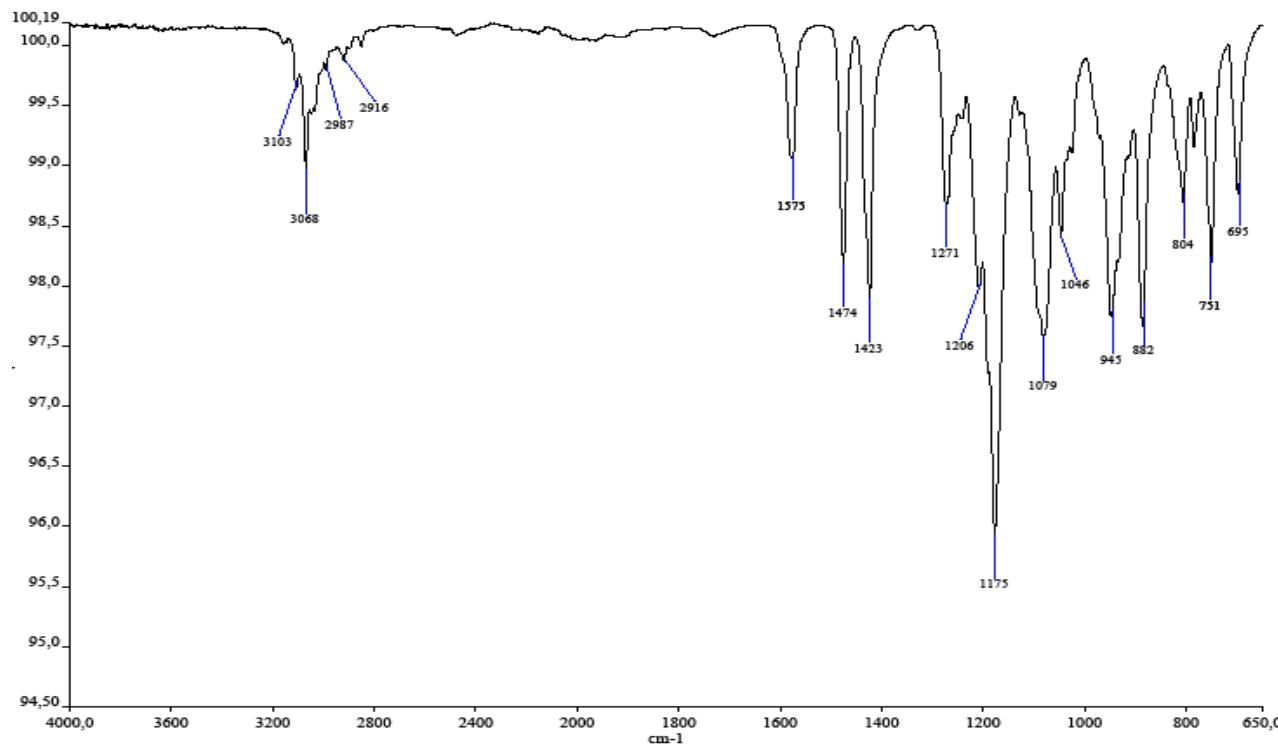
**Figure S4** FTIR spectrum of HPCP.



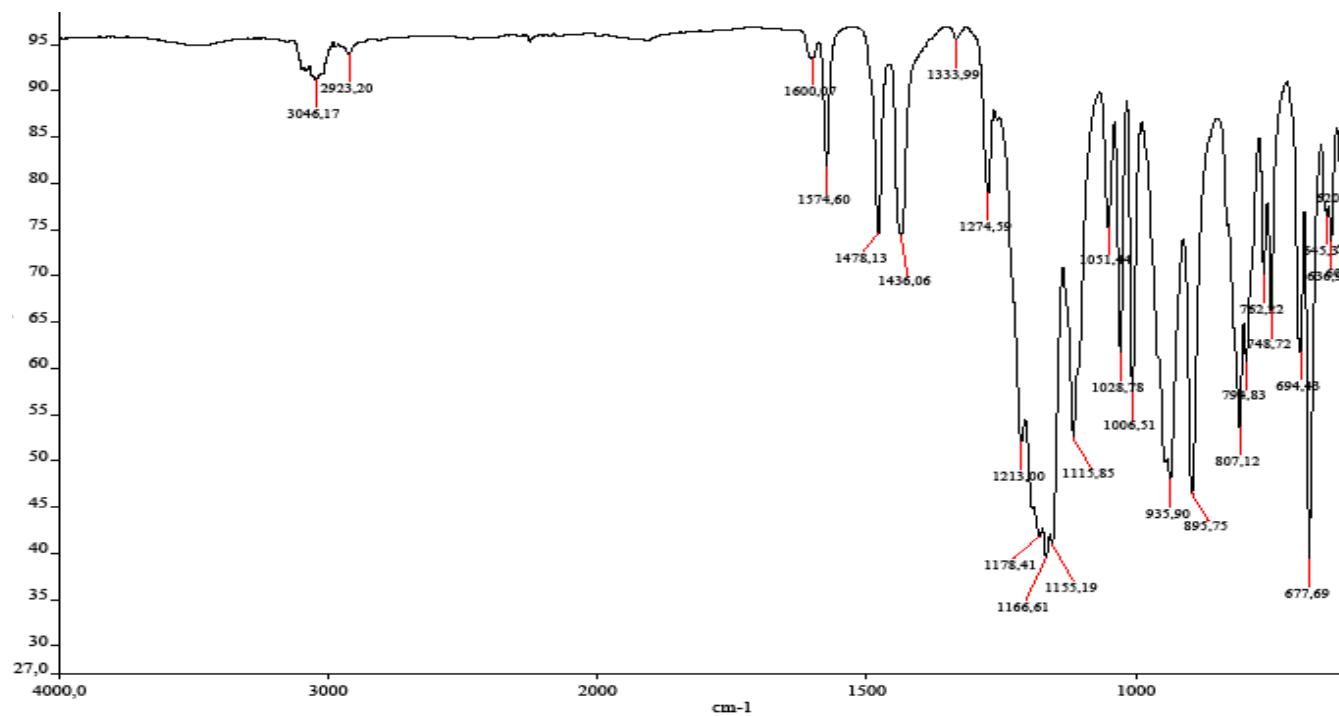
**Figure S5** FTIR spectrum of complex 1.



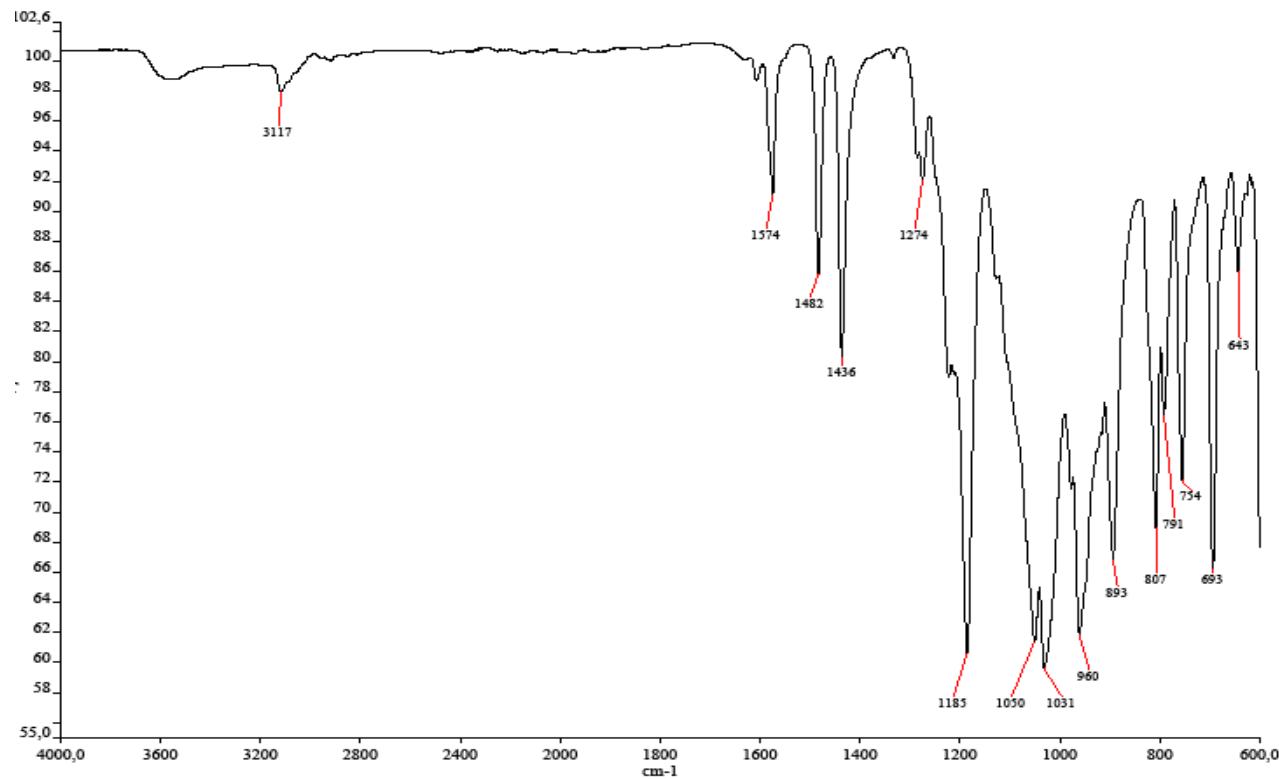
**Figure S6** FTIR spectrum of complex 2.



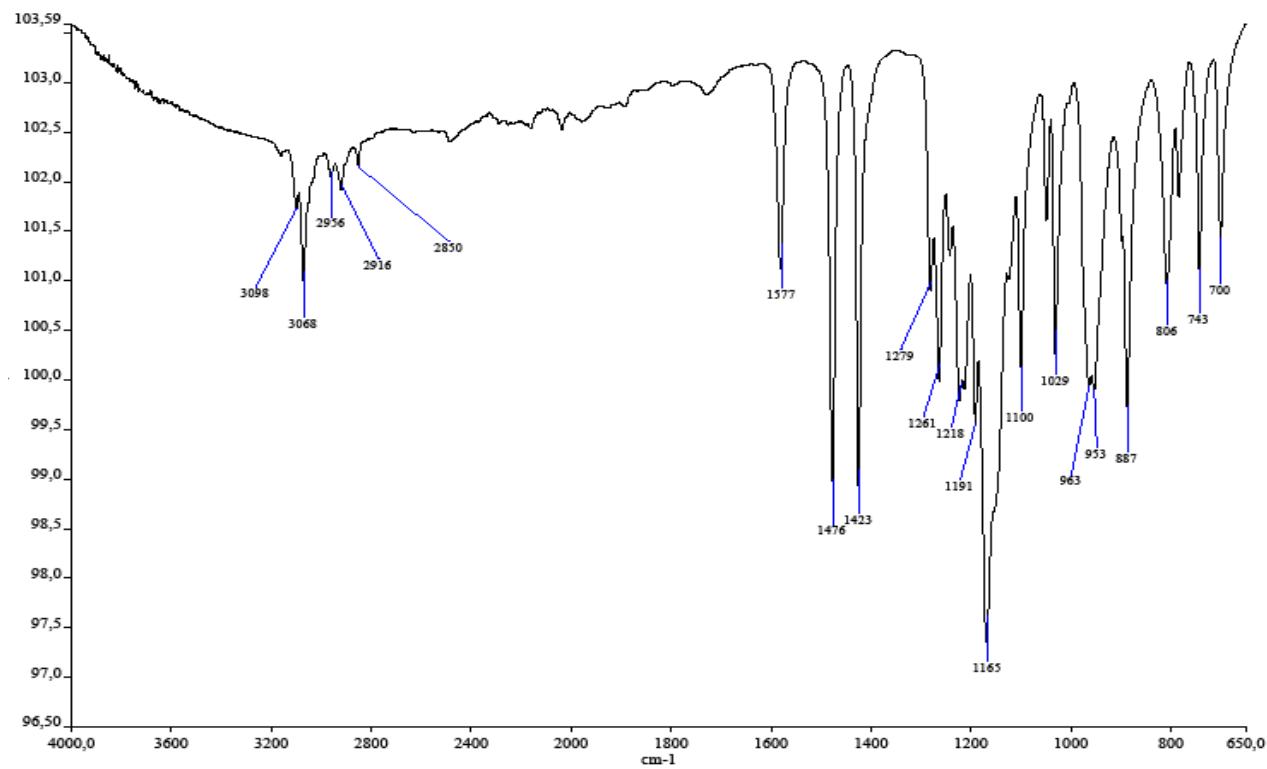
**Figure S7** FTIR spectrum of complex 3.



**Figure S8** FTIR spectrum of complex 4.



**Figure S9** FTIR spectrum of complex 5.



**Figure S10** FTIR spectrum of complex 6.

**Table S1** Selected bond lengths and angles for HPCP ligand

HPCP			
Bond Lengths (Å)			
N1-P2	1.5765(15)	N1-P1	1.5836(15)
N2-P3	1.5800(15)	N2-P2	1.5829(15)
N3-P3	1.5744(15)	N3-P1	1.5746(15)
Bond Angles (°)			
P2-N1-P1	122.46(9)	N3-P1-N1	117.24(8)
P3-N3-P1	122.22(9)	N1-P2-N2	117.35(8)
P3-N2-P2	121.60(9)	N3-P3-N2	117.65(8)

**Table S2** Selected bond lengths and angles for **1**

{[Ag <sub>2</sub> (HPCP)].(NO <sub>3</sub> ) <sub>2</sub> .H <sub>2</sub> O} <sub>n</sub> (1)			
Bond Lengths (Å)			
Ag1-N4#2	2.205(3)	Ag2-N11	2.330(3)
Ag1-N7#1	2.215(3)	Ag2-N6#5	2.231(3)
Ag1-N1	2.608(3)	Ag2-N8#1	2.360(3)
N1-P1	1.587(3)	N1-P3	1.588(3)
N2-P2	1.574(3)	N2-P1	1.580(3)
N3-P3	1.579(3)	N3-P2	1.585(3)
Bond Angles (°)			
N4#2-Ag1-N7#1	159.55(12)	N6#5-Ag2-N8#1	137.48(12)
N7#1-Ag1-N1	97.42(11)	N11-Ag2-N8#1	87.09(12)
N4#2-Ag1-N1	98.49(10)	N6#5-Ag2-N11	134.93(12)
N2-P1-N1	118.03(16)	P1-N1-P3	121.72(18)
N2-P2-N3	117.32(16)	P3-N3-P2	121.4(2)
N3-P3-N1	117.09(16)	P2-N2-P1	120.9(2)

Symmetry codes: (#1): x-1, y, z; (#2): x, y, z-1; (#3): x, y, z+1; (#4): x+1, y, z; (#5): -x+1, y-1/2, -z+1.

**Table S3** Selected bond lengths and angles for **2**.

{[Ag <sub>2</sub> (HPCP)(CH <sub>3</sub> CN)].(PF <sub>6</sub> ) <sub>2</sub> } <sub>n</sub> (2)			
Bond Lengths (Å)			
Ag1-N7#2	2.182 (3)	Ag2-N6	2.226 (3)
Ag1-N9	2.222 (3)	Ag2-N5#1	2.270 (3)
Ag1-N4#3	2.400 (3)	Ag2-N8#2	2.419 (3)
N1-P1	1.568 (3)	Ag2-N10	2.534 (4)
N1-P3	1.588 (3)	N2-P1	1.586 (3)
N2-P2	1.583 (3)	N3-P2	1.572 (3)
N3-P3	1.583 (3)		
Bond Angles (°)			
N7#2-Ag1-N9	151.70 (11)	N6-Ag2-N8#2	117.99 (11)
N7#2-Ag1-N4#3	120.33 (11)	N5#1-Ag2-N8#2	100.61 (10)
N9-Ag1-N4#3	87.91 (10)	N6-Ag2-N10	95.13 (12)
N5#1-Ag2-N10	92.23 (12)	N6-Ag2-N5#1	140.42 (11)
N8#2-Ag2-N10	91.34 (12)	N1-P1-N2	117.77 (14)
P1-N1-P3	122.44 (17)	N3-P2-N2	118.27 (14)
P2-N2-P1	119.57 (17)	N3-P3-N1	116.16 (14)
P2-N3-P3	122.29 (17)		

Symmetry codes: (#1): -x+1, -y, -z+1; (#2): -x+1, -y+1, -z+1; (#3): x+1, y, z.

**Table S4** Selected bond lengths and angles for **3**

{[Ag <sub>2</sub> (HPCP)(CH <sub>3</sub> CN)].(ClO <sub>4</sub> ) <sub>2</sub> } <sub>n</sub> ( <b>3</b> ).			
<b>Bond Lengths (Å)</b>			
Ag1-N9#1	2.192(3)	Ag2-N6#3	2.256(3)
Ag1-N7#2	2.410(4)	Ag2-N10	2.608(4)
Ag1-N5	2.222(3)	Ag2-N8#1	2.219(3)
N1-P2	1.590(3)	Ag2-N4	2.435(4)
N2-P2	1.583(3)	N1-P1	1.571(3)
N3-P3	1.586(3)	N2-P3	1.571(3)
		N3-P1	1.579(3)
<b>Bond Angles (°)</b>			
N9#1-Ag1-N5	157.74(13)	N8#1-Ag2-N4	116.57(13)
N9#1-Ag1-N7#2	112.02(13)	N8#1-Ag2-N6#3	143.14(13)
N5-Ag1-N7#2	90.20(13)	N6#3-Ag2-N4	100.09(12)
N8#1-Ag2-N10	93.47(13)	N6#3-Ag2-N10	91.49(13)
N2-P2-N1	116.48(16)	N4-Ag2-N10	87.73(13)
N2-P3-N3	117.38(16)	P1-N1-P2	121.8(2)
N1-P1-N3	118.25(16)	P1-N3-P3	119.76(19)
P3-N2-P2	122.31(19)		

Symmetry codes: (#1): -x+1, -y, -z+1; (#2): -x+1, -y+1, -z+1; (#3): x+1, y, z.

**Table S5** Selected bond lengths and angles for **4**.

<b>[Ag<sub>3</sub>(HPCP)(CH<sub>3</sub>PhSO<sub>3</sub>)<sub>3</sub>]<sub>n</sub> (4)</b>			
<b>Bond Lengths (Å)</b>			
Ag1-N6	2.162(3)	Ag2-N4	2.136(2)
Ag1-O1	2.524(2)	Ag2-N7#2	2.146(3)
Ag1-N9#1	2.171(2)	Ag2-Ag2#2	3.0865(6)
Ag1-Ag1#5	3.442	Ag2…O7	2.785(3)
Ag3-N8#3	2.226(2)	Ag2…C32	3.206(3)
Ag3-O4	2.538(2)	N1-P2	1.570(2)
Ag3-N5	2.233(2)	N2-P3	1.573(2)
Ag3-O7	2.666(3)	N3-P3	1.571(2)
N1-P1	1.578(2)	N2-P2	1.581(2)
N3-P1	1.574(2)		
<b>Bond Angles (°)</b>			
N6-Ag1-N9#1	165.88(9)	N8#3-Ag3-N5	152.04(10)
N9#1-Ag1-O1	85.93(9)	N5-Ag3-O4	98.31(9)
N6-Ag1-O1	108.18(9)	N8#3-Ag3-O4	99.52(9)
N4-Ag2-N7#2	164.12(10)	O7-Ag3-N8#3	108.25(9)
N3-P1-N1	117.65(13)	O7-Ag3-N5	90.28(9)
N1-P2-N2	117.78(12)	O4-Ag3-O7	98.02(8)
N3-P3-N2	119.04(13)	P2-N1-P1	121.12(15)
P3-N2-P2	120.29(15)	P3-N3-P1	121.48(15)

Symmetry codes: (#1): -x+2, -y, -z+1; (#2): -x+1, -y+1, -z+1; (#3): x-1, y, z.

**Table S6** Selected bond lengths and angles for **5**.

{[Ag <sub>2</sub> (HPCP)(MeCN)].(BF <sub>4</sub> ) <sub>2</sub> } <sub>n</sub> ( <b>5</b> ).			
Bond Lengths (Å)			
Ag1-N8	2.263(11)	Ag2-N9	2.653(12)
Ag1-N10	2.570(3)	Ag2-N7	2.192(11)
Ag1-N4#3	2.307(12)	Ag2-F1	2.670(2)
Ag1-N6#2	2.436(14)	Ag2-N5#1	2.202(11)
Ag1…F6	2.955(18)	N1-P3	1.583(9)
N1-P1	1.592(10)	N2-P2	1.583(9)
N2-P3	1.589(9)	N3-P2	1.561(10)
N3-P1	1.569(10)		
Bond Angles (°)			
N8-Ag1- N4#3	138.6(5)	N7-Ag2- N5#1	170.2(4)
N4#3-Ag1- N6#2	89.8(5)	N7-Ag2-N9	76.9(4)
N4#3-Ag1-N10	98.3(6)	N9-Ag2- N5#1	110.0(4)
N8-Ag1- N6#2	126.8(4)	F1-Ag2- N5#1	87.5(7)
N8-Ag1-N10	98.2(6)	F1-Ag2-N9	98.23(7)
N6#2-Ag1-N10	93.2(7)	F1-Ag2-N7	98.56(7)

Symmetry: (#1): x+1, y-1, z; (#2): x+1, y+1, z; (#3): x+1, y+1, z+1.

**Table S7** Selected bond lengths and angles for **6**.

{[Ag(HPCP)].(CF <sub>3</sub> SO <sub>3</sub> ) <sub>n</sub> (6)}			
Bond Lengths (Å)			
Ag1-N3	2.5128(19)	Ag2-N2	2.576(2)
Ag1-N3#1	2.5128(19)	Ag2-N2	2.576(2)
Ag1-N3#2	2.5128(19)	Ag2-N2	2.576(2)
Ag1-N3#3	2.5128(19)	Ag2-N2	2.576(2)
Ag1-N3#4	2.5128(19)	Ag2-N2	2.576(2)
Ag1-N3#5	2.5128(19)	Ag2-N2	2.576(2)
P1-N1	1.5797(18)	P1#1-N1#2	1.5824(18)
P1-N1#1	1.5824(18)	P1#2-N1#2	1.5797(18)
P1#1-N1#1	1.5797(18)	P1#2-N1	1.5824(18)
Bond Angles (°)			
P1-N1#1-P1#1	119.80(11)	N1-P1-N1#1	117.11(12)
P1#1-N1#2-P1#2	119.80(11)	N1#-P1#1-N1#2	117.11(12)
P1#2-N1-P1	119.80(11)	N1#2-P1#2-N1	117.11(12)
N3-Ag1-N3#1	89.97(8)	N2-Ag2-N2#6	92.53(6)
N3-Ag1-N3#2	89.98(10)	N2-Ag2-N2#10	92.53(6)
N3-Ag1-N3#3	180.00(11)	N2-Ag2-N2#7	87.47(6)
N3-Ag1-N3#4	89.99(6)	N2-Ag2-N2#8	87.47(6)
N3-Ag1-N3#5	89.99(6)	N2#6-Ag2-N2#7	87.47(6)
N3#1-Ag1-N3#4	180.00(11)	N2#6-Ag2-N2#10	92.53(6)
N3#5-Ag1-N3#2	180.00(11)	N2#7-Ag2-N2#8	92.53(6)
N3#1-Ag1-N3#3	89.97(8)	N2#10-Ag2-N2#8	87.47(6)
N3#3-Ag1-N3#4	90.01(6)	N2#10-Ag2-N2#7	180.00
N3#5-Ag1-N3#4	90.01(6)	N2#6-Ag2-N2#8	180.00
N3#5-Ag1-N3#1	89.97(8)	N2#9-Ag2-N2#8	92.53(6)
N3#2-Ag1-N3#4	90.01(6)	N2#9-Ag2-N2#7	92.53(6)
N3#1-Ag1-N3#5	89.97(8)	N2#9-Ag2-N2#6	87.47(6)
N3#2-Ag1-N3#1	89.97(8)	N2#9-Ag2-N2#10	87.47(6)
N3#2-Ag1-N3#3	89.99(6)	N2#9-Ag2-N2	180.00

Symmetry: (#1): 1-y, 1+x-y, z; (#2): -x+y, 1-x, z; (#3):2/3-x, 4/3-y, 1/3-z; (#4):-1/3+y, 1/3-x+y, 1/3-z; (#5):2/3+x-y, 1/3+x, 1/3-z.

**Table S8** Hydrogen bond parameters ( $\text{\AA}$  and  $^\circ$ ) for **1**.

<b>D-H…A</b>	<b>d(D-H)</b>	<b>d(H…A)</b>	<b>d(D-H…A)</b>	<b>D-H…A</b>
O13-H1W…O11 <sup>i</sup>	0.86(3)	2.01(3)	2.842(5)	164(3)
O13-H2W…N5 <sup>ii</sup>	0.84(4)	2.13(4)	2.972(5)	174(3)
C1-H1…O8 <sup>iii</sup>	0.95	2.25	3.060(6)	142
C4-H4…O11 <sup>ii</sup>	0.95	2.47	3.410(5)	169
C6-H6…O8 <sup>iii</sup>	0.95	2.58	3.471(5)	157
C6-H6…O9 <sup>iii</sup>	0.95	2.37	3.203(5)	146
C9-H9…O13 <sup>iv</sup>	0.95	2.60	3.481(5)	155
C11-H11…O9	0.95	2.37	3.232(5)	151
C13-H13…O12 <sup>v</sup>	0.95	2.36	3.278(5)	163
C14-H14…O7 <sup>v</sup>	0.95	2.36	3.006(5)	125
C15-H15…O7 <sup>v</sup>	0.95	2.52	3.092(5)	119
C16-H16…O9 <sup>v</sup>	0.95	2.41	3.222(5)	144
C21-H21…O10	0.95	2.60	3.370(5)	138
C25-H25…O9 <sup>iv</sup>	0.95	2.40	3.308(5)	159
C26-H26…O6	0.95	2.53	3.136(5)	122
C30-H30…O7 <sup>iv</sup>	0.95	2.38	3.089(6)	131

Symmetry codes: (i): 1-x, -1/2+y, 1-z; (ii): 1-x, -1/2+y, 2-z; (iii): 1+x, y, z; (iv): 1-x, 1/2+y, 1-z; (v): x, y, 1+z.

**Table S9** Hydrogen bond parameters ( $\text{\AA}$  and  $^\circ$ ) for **2**.

<b>D-H…A</b>	<b>d(D-H)</b>	<b>d(H…A)</b>	<b>d(D-H…A)</b>	<b>D-H…A</b>
C5-H5…F4 <sup>i</sup>	0.95	2.47	3.381(5)	160
C14-H14…F9 <sup>ii</sup>	0.95	2.44	3.304(5)	151
C16-H16…F3 <sup>iii</sup>	0.95	2.46	3.250(5)	141
C20-H20…F11 <sup>iii</sup>	0.95	2.42	3.289(6)	152
C21-H21…F7	0.95	2.42	3.221(7)	141
C30-H30…F6 <sup>iii</sup>	0.95	2.34	3.270(6)	165
C32-H32B…F6	0.98	2.25	3.108(7)	146

Symmetry codes: (i): x-1,y,z; (ii): x-1,y+1,z; (iii): -x+1, -y+1,-z+1; (iv): x, y-1, z.

**Table S10** Hydrogen bond parameters ( $\text{\AA}$  and  $^\circ$ ) for **3**.

<b>D-H…A</b>	<b>d(D-H)</b>	<b>d(H…A)</b>	<b>d(D-H…A)</b>	<b>D-H…A</b>
C1-H1…N10	0.95	2.63	3.367 (5)	135
C5-H5…O6	0.95	2.61	3.171 (4)	118
C11-H11…O9 <sup>i</sup>	0.95	2.50	3.311 (8)	144
C16-H16…O8	0.95	2.62	3.382 (9)	138
C24-H24…O6 <sup>ii</sup>	0.95	2.63	3.316 (4)	129
C28-H28…O11 <sup>iii</sup>	0.95	2.69	3.499	143
C10-H10…O10	0.95	2.72	3.381	127
C32-H32B…O8 <sup>i</sup>	0.98	2.67	3.233	117
C21-H21…O9	0.95	2.68	3.305	124

Symmetry codes: (i) -x+1, -y+1, -z; (ii) -x+1, -y, -z+1; (iii) -x, -y+1, -z+1.

**Table S11** Hydrogen bond parameters ( $\text{\AA}$  and  $^\circ$ ) for **4**.

<b>D-H…A</b>	<b>d(D-H)</b>	<b>d(H…A)</b>	<b>d(D-H…A)</b>	<b>D-H…A</b>
C3-H3…O8 <sup>i</sup>	0.95	2.44	3.285(5)	148
C13-H13…O8	0.95	2.54	2.908(5)	103
C16-H16…O4	0.95	2.59	2.939(5)	102
C16-H16…O14	0.95	2.49	3.291(4)	142
C28-H28…O10	0.95	2.56	3.175(4)	123
C30-H30…O5	0.95	2.32	3.168(5)	148
C31-H31…O8 <sup>ii</sup>	0.95	2.51	3.238(4)	133
C32-H32…O4	0.95	2.43	3.362(4)	167
C33-H33…O1 <sup>iii</sup>	0.95	2.40	3.077(5)	128
C34-H34…O3	0.95	2.32	3.231(4)	161
C37-H37…O2	0.95	2.43	3.229(4)	141
C40-H40…O6 <sup>ii</sup>	0.95	2.26	3.215(5)	177
C41-H41…O1 <sup>iii</sup>	0.95	2.50	3.288(5)	140
C42-H42…O9	0.95	2.41	3.277(4)	152
C44-H44…O3	0.95	2.55	3.227(5)	128
C44-H44…O12	0.95	2.50	3.094(4)	121
C46-H46…O8 <sup>i</sup>	0.95	2.42	3.268(4)	149
C47-H47…O7	0.95	2.46	3.193(4)	134
C51-H51…O9 <sup>i</sup>	0.95	2.45	3.318(4)	152

Symmetry codes: (i) -x+1, -y+1, -z+1; (ii) x+1, y, z; (iii) -x+2, -y, -z+1.

**Table S12** Hydrogen bond parameters ( $\text{\AA}$  and  $^\circ$ ) for **5**.

$D\cdots H\cdots A$	$d(D\cdots H)$	$d(H\cdots A)$	$d(D\cdots H\cdots A)$	$D\cdots H\cdots A$
C1-H1 $\cdots$ F8	0.93	2.45	3.30(2)	152.2
C5-H5 $\cdots$ F3	0.93	2.59	3.52(3)	171.1
C8-H8 $\cdots$ O6	0.93	2.41	2.942(16)	116.5
C9-H9 $\cdots$ F4	0.93	2.61	3.42(3)	145.9
C10-H10 $\cdots$ F6	0.93	2.42	3.20(3)	141.8
C11-H11 $\cdots$ F1	0.93	2.44	3.18(3)	136.4
C13-H13 $\cdots$ F7	0.93	2.62	3.13(2)	114.5
C16-H16 $\cdots$ F8	0.93	2.51	3.26(3)	138.2
C18-H18 $\cdots$ F2	0.93	2.42	3.09(3)	128.5
C21-H21 $\cdots$ F6	0.93	2.30	3.14(3)	149.4
C21-H21 $\cdots$ F7	0.93	2.60	3.44(3)	150.7
C32-H32B $\cdots$ F6	0.96	2.43	3.30(4)	150.6
C32-H32B $\cdots$ F7	0.96	2.53	3.42(4)	154.5