Acta Crystallographica Section E
Structure Reports Online
ISSN 1600-5368

9,9′-Biacridine

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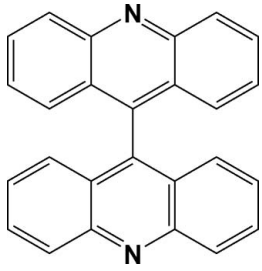
Received 20 August 2007; accepted 22 August 2007

Key indicators: single-crystal X-ray study; T = 293 K; mean σ(C–C) = 0.005 Å; R factor = 0.060; wR factor = 0.113; data-to-parameter ratio = 12.5.

The title molecule, $C_{26}H_{16}N_2$, is nonplanar, the dihedral angle between the two acridine ring systems being 84.67 (7)°. In the crystal structure, intermolecular C—H···N and C—H···π hydrogen-bonding interactions link the adjacent molecules into a two-dimensional network parallel to the *ab* plane.

Related literature

For related literature, see: Boyer *et al.* (1999); Bu *et al.* (2004); Kitagawa *et al.* (2004); Liu *et al.* (2006); Steel (2005). For relevant papers on hydrogen bonds, see: Desiraju & Steiner (1999); Sony & Ponnuswamy (2006).



Experimental

Crystal data

$C_{26}H_{16}N_2$
M_r = 356.41
Monoclinic, $C2/c$
a = 24.427 (8) Å
b = 9.463 (3) Å
c = 15.644 (5) Å
β = 98.253 (6)°
V = 3578.9 (19) Å^3
Z = 8
Mo $K\alpha$ radiation
μ = 0.08 mm^{-1}
T = 293 (2) K
0.30 × 0.25 × 0.25 mm

Data collection

Bruker SMART CCD area-detector diffractometer
Absorption correction: multi-scan (*SADABS*; Bruker, 1998)
T_{min} = 0.977, T_{max} = 0.981
8953 measured reflections
3166 independent reflections
1342 reflections with $I > 2\sigma(I)$
R_{int} = 0.099

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.060
$wR(F^2)$ = 0.113
S = 0.96
3166 reflections
253 parameters
H-atom parameters constrained
$\Delta\rho_{max}$ = 0.16 e Å^{-3}
$\Delta\rho_{min}$ = −0.17 e Å^{-3}

Table 1
Hydrogen-bond geometry (Å, °).

*Cg*1 is the centroid of the N1/C9–C13 pyridine ring.

D—H···A	D—H	H···A	D···A	D—H···A
C8—H8A···N2^{i}	0.93	2.49	3.374 (5)	159
C21—H21A···N1^{ii}	0.93	2.53	3.419 (4)	159
C19—H19A···$Cg1^{iii}$	0.93	2.88	3.764 (4)	159

Symmetry codes: (i) $-x, -y+2, -z$; (ii) $-x+\frac{1}{2}, -y+\frac{3}{2}, -z$; (iii) $x, y+1, z$.

Data collection: *SMART* (Bruker, 1998); cell refinement: *SAINT* (Bruker, 1998); data reduction: *SAINT*; program(s) used to solve structure: *SHELXS97* (Sheldrick, 1997); program(s) used to refine structure: *SHELXL97* (Sheldrick, 1997); molecular graphics: *SHELXTL* (Bruker, 1998); software used to prepare material for publication: *SHELXTL* and *PLATON* (Spek, 2003).

The author thanks Zhengzhou University of Light Industry, Henan Provincial Key Laboratory of Surface and Interface Science and Nankai University for supporting this work.

Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: CI2445).

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  doi:10.1107/S1600536807041463

supplementary materials

Acta Cryst. (2007). E**63**, o3904 [**doi:10.1107/S1600536807041463**]

9,9'-Biacridine

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Comment

N-containing heterocyclic aromatic compounds are extensively used as bridging ligands in coordination and metallosupramolecular chemistry (Steel, 2005). The most frequently used neutral bridging ligands are 4,4'-bipyridine and its derivatives (Kitagawa *et al.*, 2004). In comparison with other N-containing heterocyclic ligands, acridine-based ligands have some primary structural characteristics: (*a*) acridine ring has larger conjugated π-systems, therefore π-π stacking interactions may play important roles in the formations of their metal complexes and (*b*) the larger conjugated π-systems and the steric hindrance of H atoms of the adjacent benzene rings may probably affect the coordination abilities of the acridine N donor atom (Bu *et al.,* 2004; Liu *et al.,* 2006). Recently, we synthesized a 4,4'-bipyridyl-like linear diamine bridging ligand, 9,9'-biacridine, (I). We report here the crystal structure of (I).

Bond distances and angles in (I) (Fig. 1) have normal values, and are comparable to those observed for similar acridine-based molecules (Boyer *et al.*, 1999; Liu *et al.*, 2006). Each of the acridine ring system is essentially planar. The two acridine ring systems are twisted away from one another by an angle of 84.67 (7)°.

In the crystal structure, the adjacent molecules are linked into a chain along the [1 1 0] direction by intermolecular C—H···N hydrogen-bonding interactions (Fig. 2 and Table 1) (Desiraju *et al.*, 1999). The adjacent chains are cross-linked *via* intermolecular C—H···π interactions (Table 1) involving the N1/C9—C13 pyridine ring (centroid *Cg*1), forming a two-dimensional network parallel to the *ab* plane (Fig. 3). In the adjacent chains the acridine rings are arranged in an edge-to-face orientation (Sony *et al.*, 2006).

Experimental

Compound (I) was synthesized according to the method reported in the literature (Boyer *et al.*, 1999). A solution of (I) (0.1 mmol) in methanol (15 ml) was filtered off and the resulting solution was kept at room temperature. Yellow single crystals suitable for X-ray analysis were obtained by slow evaporation of the solvent after several days (yield: 30%). Analysis calculated for $C_{26}H_{16}N_2$: C 87.62, H 4.52, N 7.86%; found: C 87.75, H 4.59, N 7.77%.

Refinement

H atoms were included in calculated positions and treated in the subsequent refinement as riding atoms, with C—H = 0.93 Å and U_{iso}(H) = 1.2U_{eq}(C).

Figures

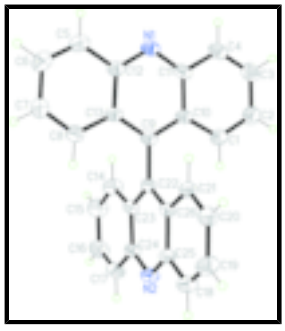

Fig. 1. The molecular structure of (I), showing the atom-labelling scheme. Displacement ellipsoids are drawn at the 30% probability level.

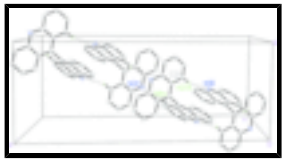

Fig. 2. Part of the crystal packing in the title compound, showing a C—H···N hydrogen-bonded (dashed lines) chain. The atoms labelled with the suffixes B and C are generated by the symmetry operations (1/2 − *x*, 3/2 − *y*, −*z*) and (−*x*, 2 − *y*, −*z*), respectively. For clarity, only H atoms involved in the interactions are shown.

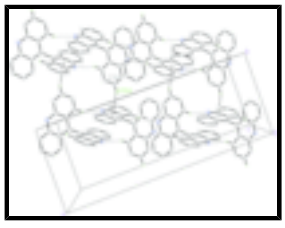

Fig. 3. View of the two-dimensional network formed by intermolecular C—H···π interactions (dashed lines).

9,9'-Biacridine

Crystal data

$C_{26}H_{16}N_2$	F_{000} = 1488
M_r = 356.41	D_x = 1.323 Mg m^{-3}
Monoclinic, *C*2/*c*	Mo *K*α radiation λ = 0.71073 Å
Hall symbol: -C 2yc	Cell parameters from 881 reflections
a = 24.427 (8) Å	θ = 2.3–21.3º
b = 9.463 (3) Å	μ = 0.08 mm^{-1}
c = 15.644 (5) Å	*T* = 293 (2) K
β = 98.253 (6)º	Block, yellow
V = 3578.9 (19) Å^3	0.30 × 0.25 × 0.25 mm
Z = 8	

Data collection

Bruker SMART CCD area-detector diffractometer	3166 independent reflections
Radiation source: fine-focus sealed tube	1342 reflections with $I > 2\sigma(I)$
Monochromator: graphite	R_{int} = 0.099
T = 293(2) K	θ_{max} = 25.0º
φ and ω scans	θ_{min} = 1.7º

Absorption correction: multi-scan (SADABS; Bruker, 1998)

T_{min} = 0.977, T_{max} = 0.981

8953 measured reflections

h = −28→28

k = −8→11

l = −14→18

Refinement

Refinement on F^2

Least-squares matrix: full

$R[F^2 > 2\sigma(F^2)]$ = 0.060

$wR(F^2)$ = 0.113

S = 0.96

3166 reflections

253 parameters

Primary atom site location: structure-invariant direct methods

Secondary atom site location: difference Fourier map

Hydrogen site location: inferred from neighbouring sites

H-atom parameters constrained

$w = 1/[\sigma^2(F_o^2) + (0.0303P)^2]$ where $P = (F_o^2 + 2F_c^2)/3$

$(\Delta/\sigma)_{max}$ = 0.002

$\Delta\rho_{max}$ = 0.16 e Å^{-3}

$\Delta\rho_{min}$ = −0.17 e Å^{-3}

Extinction correction: none

Special details

Geometry. All e.s.d.'s (except the e.s.d. in the dihedral angle between two l.s. planes) are estimated using the full covariance matrix. The cell e.s.d.'s are taken into account individually in the estimation of e.s.d.'s in distances, angles and torsion angles; correlations between e.s.d.'s in cell parameters are only used when they are defined by crystal symmetry. An approximate (isotropic) treatment of cell e.s.d.'s is used for estimating e.s.d.'s involving l.s. planes.

Refinement. Refinement of F^2 against ALL reflections. The weighted *R*-factor *wR* and goodness of fit S are based on F^2, conventional *R*-factors *R* are based on F, with F set to zero for negative F^2. The threshold expression of $F^2 > 2$sigma(F^2) is used only for calculating *R*-factors(gt) *etc*. and is not relevant to the choice of reflections for refinement. *R*-factors based on F^2 are statistically about twice as large as those based on F, and R– factors based on ALL data will be even larger.

Fractional atomic coordinates and isotropic or equivalent isotropic displacement parameters (Å^2)

	x	*y*	*z*	U_{iso}*/U_{eq}
C1	0.19370 (14)	0.7778 (3)	0.2003 (2)	0.0500 (10)
H1A	0.1676	0.8395	0.2173	0.060*
C2	0.23874 (15)	0.7408 (4)	0.2580 (2)	0.0572 (10)
H2A	0.2432	0.7773	0.3137	0.069*
C3	0.27834 (15)	0.6474 (4)	0.2331 (2)	0.0612 (11)
H3A	0.3093	0.6241	0.2724	0.073*
C4	0.27214 (13)	0.5911 (3)	0.1531 (2)	0.0544 (10)
H4A	0.2984	0.5277	0.1385	0.065*
C5	0.17604 (14)	0.5463 (4)	−0.1308 (2)	0.0545 (10)
H5A	0.2026	0.4810	−0.1420	0.065*
C6	0.13522 (16)	0.5805 (4)	−0.1946 (2)	0.0636 (11)
H6A	0.1339	0.5399	−0.2490	0.076*
C7	0.09413 (14)	0.6788 (4)	−0.1784 (2)	0.0569 (10)
H7A	0.0661	0.7030	−0.2227	0.068*

C8	0.09507 (14)	0.7383 (4)	−0.0992 (2)	0.0489 (9)
H8A	0.0675	0.8017	−0.0894	0.059*
C9	0.14161 (12)	0.7630 (3)	0.0516 (2)	0.0375 (8)
C10	0.18597 (13)	0.7233 (3)	0.1144 (2)	0.0391 (8)
C11	0.22609 (13)	0.6270 (3)	0.0906 (2)	0.0410 (9)
C12	0.17990 (13)	0.6065 (3)	−0.0472 (2)	0.0407 (9)
C13	0.13817 (12)	0.7038 (3)	−0.0310 (2)	0.0388 (8)
C14	0.03651 (14)	0.6738 (4)	0.1059 (2)	0.0566 (10)
H14A	0.0611	0.6050	0.0924	0.068*
C15	−0.01240 (15)	0.6344 (4)	0.1313 (2)	0.0662 (11)
H15A	−0.0209	0.5389	0.1345	0.079*
C16	−0.05029 (15)	0.7365 (5)	0.1529 (2)	0.0647 (11)
H16A	−0.0834	0.7081	0.1702	0.078*
C17	−0.03851 (13)	0.8749 (4)	0.1484 (2)	0.0550 (10)
H17A	−0.0637	0.9413	0.1630	0.066*
C18	0.07636 (15)	1.2536 (4)	0.08545 (19)	0.0542 (10)
H18A	0.0501	1.3163	0.1007	0.065*
C19	0.12268 (15)	1.3040 (4)	0.0582 (2)	0.0610 (10)
H19A	0.1277	1.4011	0.0545	0.073*
C20	0.16333 (14)	1.2119 (4)	0.0353 (2)	0.0532 (10)
H20A	0.1949	1.2487	0.0166	0.064*
C21	0.15701 (12)	1.0701 (3)	0.04014 (18)	0.0429 (9)
H21A	0.1843	1.0102	0.0252	0.052*
C22	0.09950 (12)	0.8657 (3)	0.07359 (18)	0.0377 (8)
C23	0.05018 (12)	0.8194 (4)	0.09971 (18)	0.0403 (8)
C24	0.01180 (13)	0.9217 (4)	0.12164 (19)	0.0415 (8)
C25	0.06751 (13)	1.1060 (3)	0.09096 (18)	0.0397 (8)
C26	0.10848 (12)	1.0121 (3)	0.06823 (17)	0.0365 (8)
N1	0.22283 (10)	0.5684 (3)	0.01215 (18)	0.0449 (8)
N2	0.02041 (10)	1.0618 (3)	0.11775 (15)	0.0447 (7)

Atomic displacement parameters (Å^2)

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
C1	0.055 (2)	0.038 (2)	0.057 (3)	0.0051 (19)	0.008 (2)	−0.001 (2)
C2	0.067 (3)	0.046 (3)	0.056 (3)	0.004 (2)	0.000 (2)	0.003 (2)
C3	0.057 (3)	0.055 (3)	0.068 (3)	0.010 (2)	−0.005 (2)	0.009 (2)
C4	0.046 (2)	0.042 (2)	0.076 (3)	0.0075 (19)	0.011 (2)	0.011 (2)
C5	0.059 (3)	0.045 (2)	0.063 (3)	0.004 (2)	0.022 (2)	−0.004 (2)
C6	0.077 (3)	0.061 (3)	0.056 (3)	−0.004 (2)	0.018 (2)	−0.010 (2)
C7	0.056 (3)	0.061 (3)	0.052 (2)	−0.004 (2)	0.0015 (19)	−0.001 (2)
C8	0.044 (2)	0.047 (2)	0.056 (2)	0.0013 (18)	0.0086 (19)	0.000 (2)
C9	0.0324 (19)	0.032 (2)	0.050 (2)	−0.0002 (17)	0.0128 (17)	0.0045 (18)
C10	0.038 (2)	0.030 (2)	0.050 (2)	0.0020 (17)	0.0116 (18)	0.0023 (18)
C11	0.0330 (19)	0.030 (2)	0.060 (3)	0.0017 (17)	0.0083 (18)	0.0112 (19)
C12	0.041 (2)	0.035 (2)	0.048 (2)	−0.0007 (18)	0.0153 (18)	0.0001 (18)
C13	0.034 (2)	0.030 (2)	0.055 (2)	−0.0009 (17)	0.0164 (18)	0.0012 (18)
C14	0.055 (2)	0.043 (3)	0.077 (3)	−0.002 (2)	0.025 (2)	0.005 (2)

C15	0.062 (3)	0.052 (3)	0.089 (3)	−0.009 (2)	0.024 (2)	0.006 (2)
C16	0.045 (2)	0.072 (3)	0.081 (3)	−0.003 (2)	0.024 (2)	0.010 (2)
C17	0.040 (2)	0.068 (3)	0.060 (3)	0.008 (2)	0.0170 (18)	0.007 (2)
C18	0.059 (3)	0.042 (3)	0.063 (3)	0.010 (2)	0.017 (2)	0.001 (2)
C19	0.071 (3)	0.037 (2)	0.078 (3)	0.000 (2)	0.020 (2)	0.004 (2)
C20	0.048 (2)	0.047 (3)	0.066 (2)	−0.005 (2)	0.0140 (18)	0.000 (2)
C21	0.041 (2)	0.037 (2)	0.051 (2)	0.0045 (19)	0.0097 (16)	−0.0013 (18)
C22	0.0327 (19)	0.040 (2)	0.041 (2)	0.0063 (18)	0.0058 (16)	−0.0002 (17)
C23	0.036 (2)	0.040 (2)	0.045 (2)	0.0037 (19)	0.0062 (16)	0.0031 (17)
C24	0.034 (2)	0.044 (2)	0.048 (2)	0.0020 (19)	0.0086 (16)	0.0021 (18)
C25	0.040 (2)	0.038 (2)	0.041 (2)	0.0056 (19)	0.0074 (16)	0.0003 (17)
C26	0.0338 (19)	0.037 (2)	0.039 (2)	0.0054 (18)	0.0066 (15)	0.0013 (17)
N1	0.0439 (18)	0.0339 (18)	0.059 (2)	0.0049 (15)	0.0141 (16)	0.0017 (16)
N2	0.0401 (18)	0.043 (2)	0.0533 (19)	0.0086 (16)	0.0131 (14)	0.0037 (15)

Geometric parameters (Å, °)

C1—C2	1.365 (4)	C14—C15	1.364 (4)
C1—C10	1.427 (4)	C14—C23	1.425 (4)
C1—H1A	0.93	C14—H14A	0.93
C2—C3	1.406 (4)	C15—C16	1.412 (4)
C2—H2A	0.93	C15—H15A	0.93
C3—C4	1.349 (4)	C16—C17	1.345 (4)
C3—H3A	0.93	C16—H16A	0.93
C4—C11	1.421 (4)	C17—C24	1.424 (4)
C4—H4A	0.93	C17—H17A	0.93
C5—C6	1.345 (4)	C18—C19	1.352 (4)
C5—C12	1.418 (4)	C18—C25	1.419 (4)
C5—H5A	0.93	C18—H18A	0.93
C6—C7	1.418 (4)	C19—C20	1.406 (4)
C6—H6A	0.93	C19—H19A	0.93
C7—C8	1.358 (4)	C20—C21	1.354 (4)
C7—H7A	0.93	C20—H20A	0.93
C8—C13	1.425 (4)	C21—C26	1.432 (4)
C8—H8A	0.93	C21—H21A	0.93
C9—C13	1.399 (4)	C22—C23	1.397 (4)
C9—C10	1.405 (4)	C22—C26	1.407 (4)
C9—C22	1.491 (4)	C23—C24	1.423 (4)
C10—C11	1.426 (4)	C24—N2	1.345 (4)
C11—N1	1.339 (4)	C25—N2	1.346 (3)
C12—N1	1.346 (4)	C25—C26	1.421 (4)
C12—C13	1.423 (4)		
C2—C1—C10	121.0 (3)	C15—C14—H14A	119.8
C2—C1—H1A	119.5	C23—C14—H14A	119.8
C10—C1—H1A	119.5	C14—C15—C16	120.9 (4)
C1—C2—C3	120.0 (3)	C14—C15—H15A	119.5
C1—C2—H2A	120.0	C16—C15—H15A	119.5
C3—C2—H2A	120.0	C17—C16—C15	120.1 (4)
C4—C3—C2	121.0 (3)	C17—C16—H16A	119.9

C4—C3—H3A	119.5	C15—C16—H16A	119.9
C2—C3—H3A	119.5	C16—C17—C24	121.2 (3)
C3—C4—C11	121.0 (3)	C16—C17—H17A	119.4
C3—C4—H4A	119.5	C24—C17—H17A	119.4
C11—C4—H4A	119.5	C19—C18—C25	120.5 (3)
C6—C5—C12	122.1 (4)	C19—C18—H18A	119.7
C6—C5—H5A	119.0	C25—C18—H18A	119.7
C12—C5—H5A	119.0	C18—C19—C20	121.0 (3)
C5—C6—C7	119.6 (4)	C18—C19—H19A	119.5
C5—C6—H6A	120.2	C20—C19—H19A	119.5
C7—C6—H6A	120.2	C21—C20—C19	120.6 (3)
C8—C7—C6	121.0 (3)	C21—C20—H20A	119.7
C8—C7—H7A	119.5	C19—C20—H20A	119.7
C6—C7—H7A	119.5	C20—C21—C26	120.2 (3)
C7—C8—C13	120.1 (3)	C20—C21—H21A	119.9
C7—C8—H8A	119.9	C26—C21—H21A	119.9
C13—C8—H8A	119.9	C23—C22—C26	118.3 (3)
C13—C9—C10	118.5 (3)	C23—C22—C9	121.0 (3)
C13—C9—C22	121.5 (3)	C26—C22—C9	120.7 (3)
C10—C9—C22	120.1 (3)	C22—C23—C24	118.8 (3)
C9—C10—C11	118.6 (3)	C22—C23—C14	122.9 (3)
C9—C10—C1	123.1 (3)	C24—C23—C14	118.2 (3)
C11—C10—C1	118.3 (3)	N2—C24—C23	123.2 (3)
N1—C11—C4	117.9 (3)	N2—C24—C17	117.8 (3)
N1—C11—C10	123.4 (3)	C23—C24—C17	119.0 (3)
C4—C11—C10	118.7 (3)	N2—C25—C18	118.0 (3)
N1—C12—C5	118.1 (3)	N2—C25—C26	123.2 (3)
N1—C12—C13	123.9 (3)	C18—C25—C26	118.8 (3)
C5—C12—C13	118.1 (3)	C22—C26—C25	118.6 (3)
C9—C13—C12	118.3 (3)	C22—C26—C21	122.6 (3)
C9—C13—C8	122.7 (3)	C25—C26—C21	118.8 (3)
C12—C13—C8	119.1 (3)	C11—N1—C12	117.3 (3)
C15—C14—C23	120.5 (3)	C24—N2—C25	117.8 (3)
C10—C1—C2—C3	−0.1 (5)	C13—C9—C22—C23	84.9 (4)
C1—C2—C3—C4	−1.3 (5)	C10—C9—C22—C23	−95.0 (4)
C2—C3—C4—C11	1.6 (5)	C13—C9—C22—C26	−94.8 (4)
C12—C5—C6—C7	−0.6 (5)	C10—C9—C22—C26	85.2 (4)
C5—C6—C7—C8	−0.5 (5)	C26—C22—C23—C24	−1.4 (4)
C6—C7—C8—C13	0.8 (5)	C9—C22—C23—C24	178.8 (3)
C13—C9—C10—C11	1.3 (4)	C26—C22—C23—C14	178.9 (3)
C22—C9—C10—C11	−178.8 (3)	C9—C22—C23—C14	−0.9 (4)
C13—C9—C10—C1	179.5 (3)	C15—C14—C23—C22	−179.7 (3)
C22—C9—C10—C1	−0.5 (4)	C15—C14—C23—C24	0.6 (5)
C2—C1—C10—C9	−177.1 (3)	C22—C23—C24—N2	0.6 (5)
C2—C1—C10—C11	1.1 (4)	C14—C23—C24—N2	−179.7 (3)
C3—C4—C11—N1	179.3 (3)	C22—C23—C24—C17	−180.0 (3)
C3—C4—C11—C10	−0.6 (5)	C14—C23—C24—C17	−0.2 (4)
C9—C10—C11—N1	−2.3 (4)	C16—C17—C24—N2	179.2 (3)
C1—C10—C11—N1	179.4 (3)	C16—C17—C24—C23	−0.2 (5)

C9—C10—C11—C4	177.6 (3)	C19—C18—C25—N2	−179.4 (3)
C1—C10—C11—C4	−0.8 (4)	C19—C18—C25—C26	0.7 (5)
C6—C5—C12—N1	−178.6 (3)	C23—C22—C26—C25	1.1 (4)
C6—C5—C12—C13	1.4 (5)	C9—C22—C26—C25	−179.2 (3)
C10—C9—C13—C12	−0.1 (4)	C23—C22—C26—C21	−178.4 (3)
C22—C9—C13—C12	180.0 (3)	C9—C22—C26—C21	1.3 (4)
C10—C9—C13—C8	−179.4 (3)	N2—C25—C26—C22	0.2 (4)
C22—C9—C13—C8	0.7 (4)	C18—C25—C26—C22	−179.9 (3)
N1—C12—C13—C9	−0.4 (5)	N2—C25—C26—C21	179.7 (3)
C5—C12—C13—C9	179.6 (3)	C18—C25—C26—C21	−0.3 (4)
N1—C12—C13—C8	178.9 (3)	C20—C21—C26—C22	179.3 (3)
C5—C12—C13—C8	−1.0 (4)	C20—C21—C26—C25	−0.2 (4)
C7—C8—C13—C9	179.3 (3)	C4—C11—N1—C12	−178.1 (3)
C7—C8—C13—C12	0.0 (4)	C10—C11—N1—C12	1.8 (4)
C23—C14—C15—C16	−0.6 (5)	C5—C12—N1—C11	179.5 (3)
C14—C15—C16—C17	0.1 (6)	C13—C12—N1—C11	−0.4 (4)
C15—C16—C17—C24	0.3 (5)	C23—C24—N2—C25	0.6 (4)
C25—C18—C19—C20	−0.5 (5)	C17—C24—N2—C25	−178.8 (3)
C18—C19—C20—C21	−0.1 (5)	C18—C25—N2—C24	179.0 (3)
C19—C20—C21—C26	0.4 (5)	C26—C25—N2—C24	−1.1 (4)

Hydrogen-bond geometry (Å, °)

D—H···*A*	*D*—H	H···*A*	*D*···*A*	*D*—H···*A*
C8—H8A···N2^{i}	0.93	2.49	3.374 (5)	159
C21—H21A···N1^{ii}	0.93	2.53	3.419 (4)	159
C19—H19A···Cg1^{iii}	0.93	2.88	3.764 (4)	159

Symmetry codes: (i) −*x*, −*y*+2, −*z*; (ii) −*x*+1/2, −*y*+3/2, −*z*; (iii) *x*, *y*+1, *z*.

Fig. 1

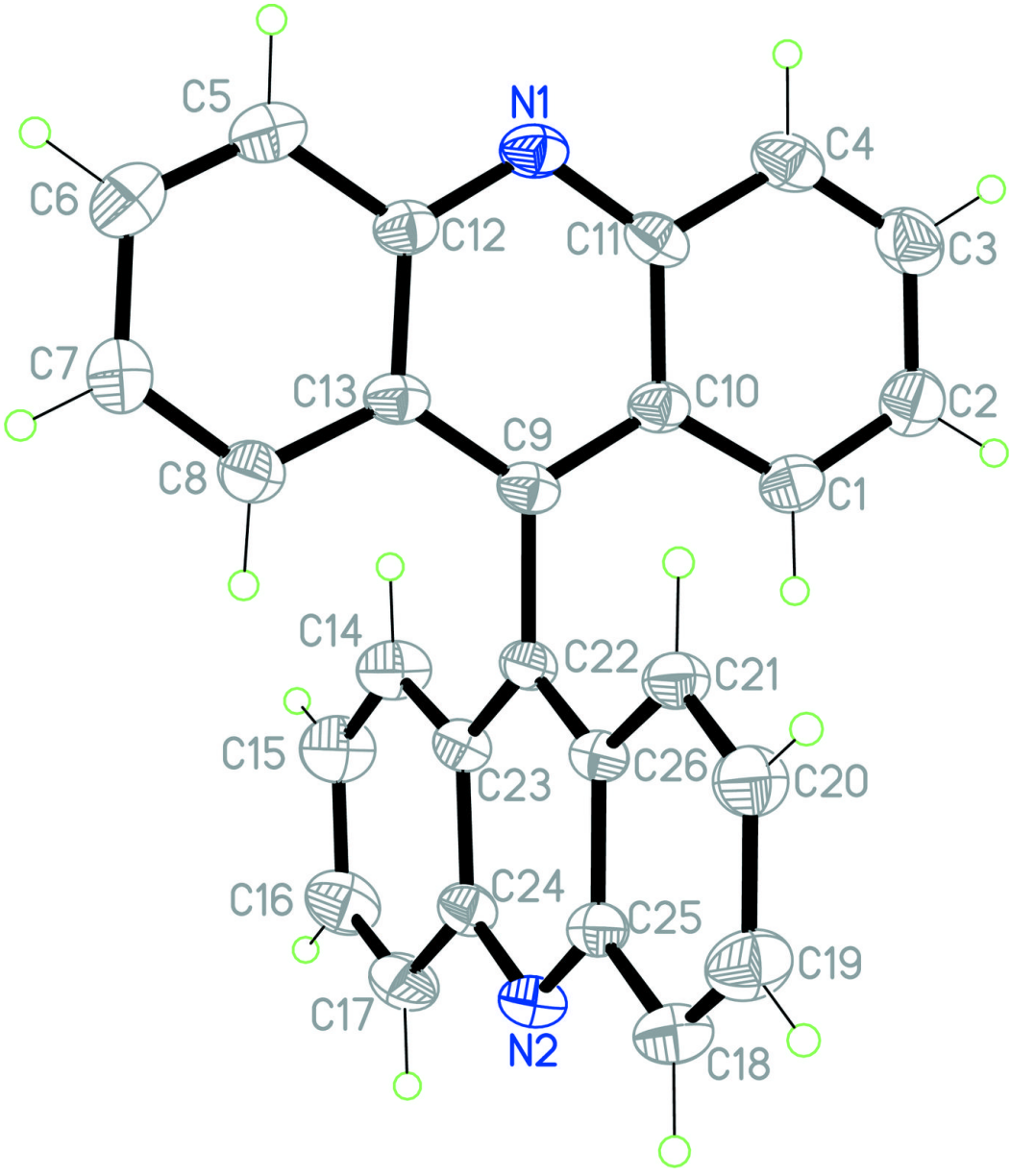
C5
N1
C4
C6
C12
C11
C3
C7
C13
C10
C2
C9
C8
C1
C14
C22
C21
C15
C23
C26
C20
C16
C24
C25
C19
C17
N2
C18

Fig. 2

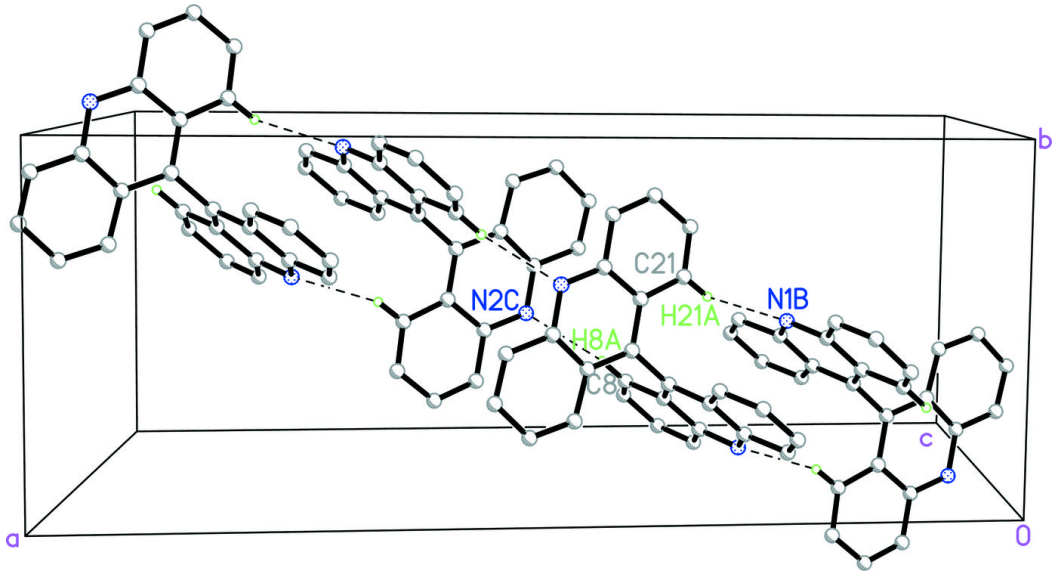

Fig. 3