Acta Crystallographica Section E
Structure Reports Online
ISSN 1600-5368

2-Methyl-3-(4-nitrophenyl)acrylic acid

Niaz Muhammad,[a] M. Nawaz Tahir,[b]* Zia-ur-Rehman[a] and Saqib Ali[a]

[a]Department of Chemistry, Quaid-i-Azam University, Islamabad 45320, Pakistan, and [b]University of Sargodha, Department of Physics, Sargodha, Pakistan
Correspondence e-mail: dmntahir_uos@yahoo.com

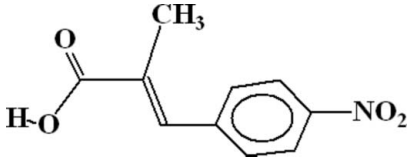
Received 10 July 2008; accepted 3 August 2008

Key indicators: single-crystal X-ray study; T = 296 K; mean σ(C–C) = 0.002 Å; R factor = 0.043; wR factor = 0.134; data-to-parameter ratio = 18.0.

The title compound, $C_{10}H_9NO_4$, forms $R_2^2(8)$ dimers due to intermolecular O—H···O hydrogen bonding in the crystal structure. Two dimers are further linked to each other through two intermolecular C—H···O hydrogen bonds, forming an $R_3^3(7)$ ring motif. The nitro groups form an intramolecular C—H···O hydrogen bond mimicking a five-membered ring. As a result of these hydrogen bonds, polymeric sheets are formed. The aromatic ring makes a dihedral angle of 42.84 (8)° with the carboxylate group and an angle of 8.01 (14)° with the nitro group. There is a π-interaction (N—O···π) between the nitro group and the aromatic ring, with a distance of 3.7572 (14) Å between the N atom and the centroid of the aromatic ring.

Related literature

For related literature, see: Bernstein *et al.* (1995); Fujii *et al.* (2002); Ma & Hayes (2004); Muhammad *et al.* (2007, 2008*a*,*b*); Muhammad, Ali, Tahir & Zia-ur-Rehman (2008); Muhammad, Tahir, Ali, Zia-ur-Rehman & Kashmiri (2008); Muhammad, Tahir, Zia-ur-Rehman & Ali (2008); Muhammad, Tahir, Zia-ur-Rehman, Ali & Shaheen, 2008); Niaz *et al.* (2008).



Experimental

Crystal data

$C_{10}H_9NO_4$
M_r = 207.18
Triclinic, $P\overline{1}$
a = 7.3878 (3) Å
b = 8.1050 (5) Å
c = 8.3402 (4) Å
α = 75.793 (2)°
β = 81.835 (3)°
γ = 87.686 (2)°
V = 479.21 (4) Å^3
Z = 2
Mo $K\alpha$ radiation
μ = 0.11 mm^{-1}
T = 296 (2) K
0.25 × 0.20 × 0.18 mm

Data collection

Bruker Kappa APEXII CCD diffractometer
Absorption correction: multi-scan (*SADABS*; Bruker, 2005)
T_{min} = 0.970, T_{max} = 0.981
9039 measured reflections
2518 independent reflections
1926 reflections with $I > 2\sigma(I)$
R_{int} = 0.023

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.042
$wR(F^2)$ = 0.134
S = 1.02
2518 reflections
140 parameters
H atoms treated by a mixture of independent and constrained refinement
$\Delta\rho_{max}$ = 0.24 e Å^{-3}
$\Delta\rho_{min}$ = −0.21 e Å^{-3}

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

D—H···A	D—H	H···A	D···A	D—H···A
O1—H1···O2^{i}	0.93 (2)	1.71 (2)	2.6333 (15)	177 (2)
C3—H3···O1	0.93	2.31	2.7080 (17)	105
C8—H8···O1^{ii}	0.93	2.55	3.3471 (17)	144
C9—H9···O2^{iii}	0.93	2.60	3.4912 (17)	161

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

Data collection: *APEX2* (Bruker, 2007); cell refinement: *APEX2*; data reduction: *SAINT* (Bruker, 2007); program(s) used to solve structure: *SHELXS97* (Sheldrick, 2008); program(s) used to refine structure: *SHELXL97* (Sheldrick, 2008); molecular graphics: *ORTEP-3 for Windows* (Farrugia, 1997) and *PLATON* (Spek, 2003); software used to prepare material for publication: *WinGX* (Farrugia, 1999) and *PLATON*.

The authors acknowledge the Higher Education Commission, Islamabad, Pakistan, for funding the purchase of the diffractometer at GCU, Lahore and for financial support to Niaz Muhammad for PhD studies under the Indigenous Scholarship Scheme.

Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: CS2087).

References

Bernstein, J., Davis, R. E., Shimoni, L. & Chang, N.-L. (1995). *Angew. Chem. Int. Ed. Engl.* **34**, 1555–1573.
Bruker (2005). *SADABS*. Bruker AXS Inc. Madison, Wisconsin, USA.
Bruker (2007). *APEX2* and *SAINT*. Bruker AXS Inc. Madison, Wisconsin, USA.
Farrugia, L. J. (1997). *J. Appl. Cryst.* **30**, 565.
Farrugia, L. J. (1999). *J. Appl. Cryst.* **32**, 837–838.
Fujii, T., Shimaya, C., Yano, A., Terado, K., Sugino, H. & Fukuda, H. (2002). *Biotechnol. Lett.* **24**, 151–154.
Ma, G. & Hayes, S. E. J. (2004). *Labelled Compd. Radiopharm.* **47**, 895–901.
Muhammad, N., Ali, S., Tahir, M. N. & Zia-ur-Rehman (2008). *Acta Cryst.* E**64**, o1373.
Muhammad, N., Tahir, M. N., Ali, S. & Zia-ur-Rehman (2008*a*). *Acta Cryst.* E**64**, m946–m947.
Muhammad, N., Tahir, M. N., Ali, S. & Zia-ur-Rehman (2008*b*). *Acta Cryst.* E**64**, m978.
Muhammad, N., Tahir, M. N., Ali, S., Zia-ur-Rehman & Kashmiri, M. A. (2008). *Acta Cryst.* E**64**, o1456.
Muhammad, N., Tahir, M. N., Zia-ur-Rehman & Ali, S. (2008). *Acta Cryst.* E**64**, o1458.
Muhammad, N., Tahir, M. N., Zia-ur-Rehman, Ali, S. & Shaheen, F. (2008). *Acta Cryst.* E**64**, o1542.

Muhammad, N., Zia-ur-Rehman, Ali, S. & Meetsma, A. (2007). *Acta Cryst.* E**63**, o2174–o2175.
Niaz, M., Tahir, M. N., Zia-ur-Rehman, Ali, S. & Khan, I. U. (2008). *Acta Cryst.* E**64**, o733.
Sheldrick, G. M. (2008). *Acta Cryst.* A**64**, 112–122.
Spek, A. L. (2003). *J. Appl. Cryst.* **36**, 7–13.

supporting information

Acta Cryst. (2008). E**64**, o1717–o1718 [doi:10.1107/S1600536808024999]

2-Methyl-3-(4-nitrophenyl)acrylic acid

Niaz Muhammad, M. Nawaz Tahir, Zia-ur-Rehman and Saqib Ali

S1. Comment

Cinnamic acid derivatives are widely used chemicals in a variety of fields (Ma *et al.*, 2004). They have been applied as antibacterial agents for suppression of bacterial growth (Fujii *et al.*, 2002). In wine, cinnamic acid and its derivatives join benzoic acid derivatives and flavonoids in creating pigments and tannin agents that give each vintage its characteristic bouquet and color. The title compound has been prepared in continuation of synthesizing various derivatives of cinamic acids (Niaz *et al.*, 2008; Muhammad, Ali, Tahir & Zia-ur-Rehman, 2008; Muhammad, Tahir, Ali, Zia-ur-Rehman & Kashmiri, 2008) and their tin complexes (Muhammad *et al.*, 2008*a*,*b*).

The crystal structures of 3-(4-isopropylphenyl)-2-methylacrylic acid (Muhammad, Tahir, Ali, Zia-ur-Rehman & Kashmiri, 2008), of 3-(4-clorophenyl)-2-methylacrylic acid (Muhammad, Tahir, Zia-ur-Rehman, Ali & Shaheen, 2008) and of 3-(4-bromophenyl)-2-methylacrylic acid (Muhammad *et al.*, 2007) have been reported. The title compound differs from these compounds due to the nitro group at *para* position. In the crystal structure of the title compound, the exocyclic C_{sp2}—C_{sp2} bonds are of 1.4770 (18) and 1.4880 (18) Å, the C==C is of 1.3376 (18) Å. The C—O bond length 1.2996 (16) Å is normal, much like the C=O bond length of 1.2300 (15) Å. The resonant N—O bond lengths are equal (1.2185 (16) and 1.2204 (17) Å). There is an interamolecular H-bond of C—H···O type (Table 1, Fig 1). Centrosymmetric $R_2^2(8)$ dimers (Bernstein *et al.* 1995) are formed due to the intermolecular O1—H1···O2^{i} [symmetry code: i = -*x*, -*y*, -*z* + 1] hydrogen bonding. Two adjacent dimers are linked to each other through two intermolecular H-bonds of C—H···O type forming an $R_3^3(7)$ motif (Bernstein *et al.* 1995). The group of two dimers are linked to each other by intermolcular H-bonding (Table 1, Fig 2). There exist an N1—O4···*Cg*^{ii} [symmetry code: ii = -*x* + 1, -*y* + 2, -*z*] interaction with a distance of 3.7572 (14) Å between the N-atom and the centroid of the (C4—C9) aromatic ring. The aromatic ring makes a dihedral angle of 42.84 (8)° with with the carboxylate (O1/C1/O2) moiety and 8.01 (14)° with the (N1/O3/O4) nitro group. Due to the intermolecular H-bonding polymeric sheets are formed.

S2. Experimental

The title compound was prepared according to a reported procedure (Muhammad *et al.*, 2007). A mixture of 4-nitro-benzaldehyde (1.51 g, 10 mmol), methylmalonic acid (2.36 g, 20 mmol) and piperidine (1.98 ml, 20 mmol) in a pyridine (12.5 ml) solution was heated on a steam-bath for 24 h. The reaction mixture was cooled and added to a mixture of 25 ml of concentrated HCl and 50 g of ice. The precipitate formed in the acidified mixture was filtered off and washed with ice-cold water. The product was recrystallized from ethanol. The yield was 79%.

S3. Refinement

The coordinates of H-atom attached with O1 were refined. The H-atoms attached with C-atoms were positioned geometrically, C—H = 0.93, and 0.96 Å for aromatic and methyl H, and constrained to ride on their parent atoms. The H-atoms were treated as isotropic with U_{iso}(H) = xU_{eq}(C,*O*), where *x* = 1.5 for methyl H, and *x* = 1.2 for all other H atoms.

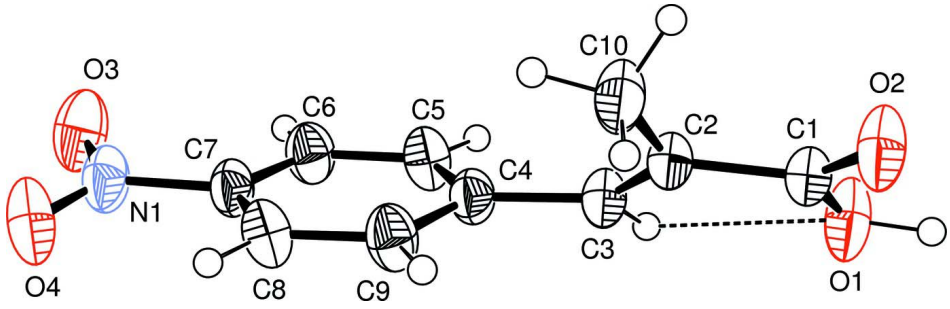


Figure 1

ORTEP drawing of the title compound, $C_{11}H_{12}O_2$ with the atom numbering scheme. The thermal ellipsoids are drawn at the 50% probability level. H-atoms are shown by small circles of arbitrary radii. The intramolecular H-bonds are shown by dotted lines.

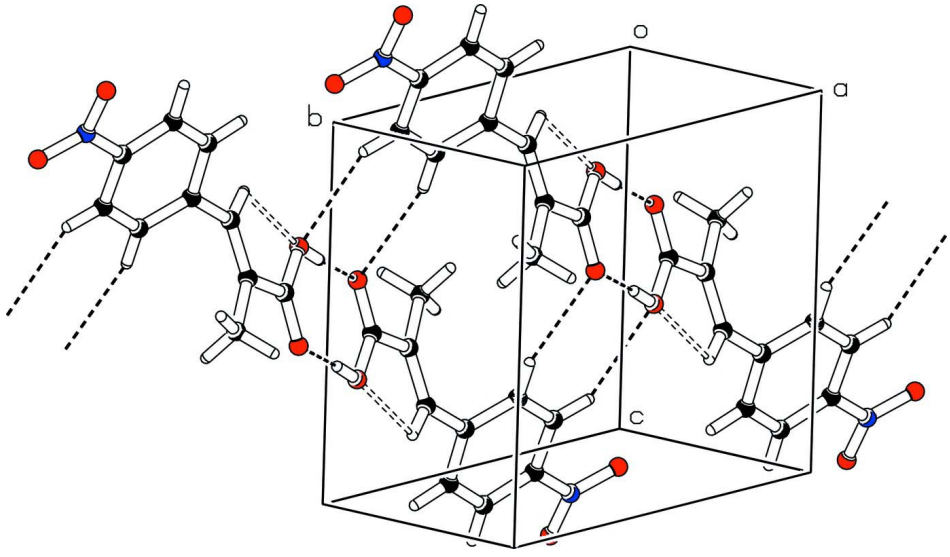


Figure 2

The packing figure (*PLATON*: Spek, 2003) which shows the dimeric nature of the compound and the interlinkages of the dimers.

2-Methyl-3-(4-nitrophenyl)acrylic acid

Crystal data

$C_{10}H_9NO_4$
$M_r = 207.18$
Triclinic, $P\overline{1}$
Hall symbol: -P 1
$a = 7.3878$ (3) Å
$b = 8.1050$ (5) Å
$c = 8.3402$ (4) Å
$\alpha = 75.793$ (2)°
$\beta = 81.835$ (3)°
$\gamma = 87.686$ (2)°
$V = 479.21$ (4) Å^3
$Z = 2$
$F(000) = 216$
$D_x = 1.436$ Mg m^{-3}
Mo $K\alpha$ radiation, $\lambda = 0.71073$ Å
Cell parameters from 2518 reflections
$\theta = 2.5$–29.1°
$\mu = 0.11$ mm^{-1}
$T = 296$ K
Prismatic, colourless
0.25 × 0.20 × 0.18 mm

Data collection

Bruker Kappa APEXII CCD diffractometer
Radiation source: fine-focus sealed tube
Graphite monochromator
Detector resolution: 7.4 pixels mm^{-1}
ω scans
Absorption correction: multi-scan (*SADABS*; Bruker, 2005)
T_{min} = 0.970, T_{max} = 0.981
9039 measured reflections
2518 independent reflections
1926 reflections with $I > 2\sigma(I)$
R_{int} = 0.023
θ_{max} = 29.1°, θ_{min} = 2.5°
h = −10→9
k = −11→9
l = −11→11

Refinement

Refinement on F^2
Least-squares matrix: full
$R[F^2 > 2\sigma(F^2)]$ = 0.042
$wR(F^2)$ = 0.134
S = 1.02
2518 reflections
140 parameters
0 restraints
Primary atom site location: structure-invariant direct methods
Secondary atom site location: difference Fourier map
Hydrogen site location: inferred from neighbouring sites
H atoms treated by a mixture of independent and constrained refinement
$w = 1/[\sigma^2(F_o^2) + (0.0713P)^2 + 0.0915P]$ where $P = (F_o^2 + 2F_c^2)/3$
$(\Delta/\sigma)_{max} < 0.001$
$\Delta\rho_{max}$ = 0.24 e Å^{-3}
$\Delta\rho_{min}$ = −0.21 e Å^{-3}

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

	x	y	z	U_{iso}*/U_{eq}
O1	0.04661 (16)	0.13519 (13)	0.29456 (12)	0.0547 (4)
O2	0.09796 (15)	0.16087 (12)	0.54300 (12)	0.0526 (3)
O3	0.52309 (18)	1.11600 (15)	−0.36244 (14)	0.0661 (4)
O4	0.35761 (19)	1.23296 (13)	−0.18699 (15)	0.0648 (4)
N1	0.41247 (18)	1.10856 (14)	−0.23745 (14)	0.0466 (4)
C1	0.10453 (16)	0.21896 (15)	0.39150 (15)	0.0357 (3)
C2	0.17797 (17)	0.39231 (15)	0.31101 (16)	0.0362 (3)
C3	0.17195 (18)	0.45348 (15)	0.14759 (16)	0.0378 (3)
C4	0.22936 (17)	0.62471 (15)	0.04743 (15)	0.0361 (3)
C5	0.3308 (2)	0.64219 (16)	−0.11015 (16)	0.0424 (4)
C6	0.39099 (19)	0.80039 (17)	−0.20464 (16)	0.0425 (4)
C7	0.34487 (18)	0.94026 (15)	−0.14089 (15)	0.0375 (4)
C8	0.2375 (2)	0.92912 (16)	0.01030 (17)	0.0432 (4)
C9	0.1804 (2)	0.76957 (16)	0.10462 (16)	0.0430 (4)
C10	0.2580 (2)	0.47901 (17)	0.42356 (17)	0.0480 (4)
H1	−0.005 (3)	0.032 (3)	0.355 (2)	0.0656*
H3	0.12727	0.38114	0.09157	0.0454*
H5	0.35821	0.54652	−0.15208	0.0508*
H6	0.46089	0.81202	−0.30868	0.0510*
H8	0.20402	1.02624	0.04821	0.0518*
H9	0.10844	0.75935	0.20750	0.0516*
H10A	0.33667	0.40104	0.48836	0.0719*
H10B	0.16126	0.51574	0.49695	0.0719*
H10C	0.32723	0.57588	0.35757	0.0719*

Atomic displacement parameters (Å²)

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
O1	0.0855 (8)	0.0371 (5)	0.0397 (5)	−0.0259 (5)	−0.0071 (5)	−0.0026 (4)
O2	0.0801 (7)	0.0381 (5)	0.0357 (5)	−0.0229 (5)	−0.0058 (5)	0.0008 (4)
O3	0.0862 (8)	0.0524 (7)	0.0487 (6)	−0.0249 (6)	0.0068 (6)	0.0033 (5)
O4	0.1010 (9)	0.0290 (5)	0.0614 (7)	−0.0085 (5)	−0.0120 (6)	−0.0036 (5)
N1	0.0638 (7)	0.0340 (6)	0.0385 (6)	−0.0119 (5)	−0.0133 (5)	0.0030 (5)
C1	0.0399 (6)	0.0288 (6)	0.0353 (6)	−0.0057 (5)	−0.0021 (5)	−0.0028 (4)
C2	0.0379 (6)	0.0278 (5)	0.0392 (6)	−0.0052 (5)	−0.0024 (5)	−0.0019 (5)
C3	0.0443 (6)	0.0284 (6)	0.0380 (6)	−0.0068 (5)	−0.0037 (5)	−0.0029 (5)
C4	0.0416 (6)	0.0294 (6)	0.0342 (6)	−0.0041 (5)	−0.0064 (5)	−0.0004 (4)
C5	0.0569 (8)	0.0300 (6)	0.0375 (6)	−0.0005 (5)	−0.0009 (5)	−0.0062 (5)
C6	0.0521 (7)	0.0360 (6)	0.0338 (6)	−0.0020 (5)	0.0023 (5)	−0.0023 (5)
C7	0.0468 (7)	0.0281 (6)	0.0343 (6)	−0.0062 (5)	−0.0093 (5)	0.0017 (5)
C8	0.0607 (8)	0.0292 (6)	0.0380 (6)	0.0016 (5)	−0.0052 (6)	−0.0062 (5)
C9	0.0554 (8)	0.0348 (6)	0.0334 (6)	−0.0009 (5)	0.0030 (5)	−0.0029 (5)
C10	0.0626 (8)	0.0353 (7)	0.0437 (7)	−0.0160 (6)	−0.0124 (6)	0.0001 (5)

Geometric parameters (Å, º)

O1—C1	1.2996 (16)	C5—C6	1.3832 (19)
O2—C1	1.2300 (15)	C6—C7	1.3774 (19)
O3—N1	1.2204 (17)	C7—C8	1.3759 (19)
O4—N1	1.2185 (16)	C8—C9	1.3855 (19)
O1—H1	0.93 (2)	C3—H3	0.9300
N1—C7	1.4698 (17)	C5—H5	0.9300
C1—C2	1.4880 (18)	C6—H6	0.9300
C2—C3	1.3376 (18)	C8—H8	0.9300
C2—C10	1.4965 (19)	C9—H9	0.9300
C3—C4	1.4770 (18)	C10—H10A	0.9600
C4—C9	1.3887 (18)	C10—H10B	0.9600
C4—C5	1.3951 (18)	C10—H10C	0.9600
O1···C8^{i}	3.3471 (17)	C4···H10C	2.7200
O1···C6^{ii}	3.4128 (19)	C4···H3^{ii}	3.0300
O1···O2^{iii}	2.6333 (15)	C9···H10C	2.6400
O2···O1^{iii}	2.6333 (15)	C10···H9	2.8300
O2···C1^{iii}	3.3657 (16)	C10···H10B^{v}	3.0700
O2···N1^{iv}	3.1112 (17)	H1···O1^{iii}	2.882 (17)
O1···H1^{iii}	2.882 (17)	H1···O2^{iii}	1.71 (2)
O1···H3	2.3100	H1···C1^{iii}	2.59 (2)
O1···H8^{i}	2.5500	H1···H1^{iii}	2.36 (2)
O2···H10B	2.8600	H3···O1	2.3100
O2···H10A	2.5900	H3···H5	2.5900
O2···H1^{iii}	1.71 (2)	H3···C4^{ii}	3.0300
O2···H9^{v}	2.6000	H5···O4^{i}	2.6300
O3···H6	2.4400	H5···H3	2.5900

O3···H10A^{vi}	2.7600	H6···O3	2.4400
O3···H6^{vii}	2.6500	H6···O3^{vii}	2.6500
O3···H10C^{viii}	2.7800	H6···C2^{x}	3.0800
O4···H5^{ix}	2.6300	H8···O1^{ix}	2.5500
O4···H8	2.4200	H8···O4	2.4200
O4···H10A^{vi}	2.7400	H9···C2	2.9300
O4···H10C^{viii}	2.8500	H9···C10	2.8300
N1···O2^{vi}	3.1112 (17)	H9···H10C	2.4200
N1···C8^{viii}	3.378 (2)	H9···O2^{v}	2.6000
C1···O2^{iii}	3.3657 (16)	H10A···O2	2.5900
C2···C6^{x}	3.5837 (19)	H10A···O3^{iv}	2.7600
C6···O1^{ii}	3.4128 (19)	H10A···O4^{iv}	2.7400
C6···C2^{x}	3.5837 (19)	H10B···O2	2.8600
C8···N1^{viii}	3.378 (2)	H10B···C1^{v}	3.0800
C8···O1^{ix}	3.3471 (17)	H10B···C2^{v}	2.9500
C9···C10	3.1937 (19)	H10B···C10^{v}	3.0700
C10···C9	3.1937 (19)	H10B···H10B^{v}	2.4000
C1···H10B^{v}	3.0800	H10C···C4	2.7200
C1···H1^{iii}	2.59 (2)	H10C···C9	2.6400
C2···H9	2.9300	H10C···H9	2.4200
C2···H10B^{v}	2.9500	H10C···O3^{viii}	2.7800
C2···H6^{x}	3.0800	H10C···O4^{viii}	2.8500

C1—O1—H1	111.6 (12)	C7—C8—C9	118.33 (12)
O3—N1—O4	123.45 (13)	C4—C9—C8	120.81 (12)
O3—N1—C7	118.21 (12)	C2—C3—H3	117.00
O4—N1—C7	118.33 (12)	C4—C3—H3	117.00
O1—C1—O2	122.55 (12)	C4—C5—H5	120.00
O1—C1—C2	116.77 (11)	C6—C5—H5	120.00
O2—C1—C2	120.68 (11)	C5—C6—H6	121.00
C1—C2—C10	115.28 (11)	C7—C6—H6	121.00
C3—C2—C10	126.40 (12)	C7—C8—H8	121.00
C1—C2—C3	118.29 (11)	C9—C8—H8	121.00
C2—C3—C4	126.35 (12)	C4—C9—H9	120.00
C3—C4—C9	121.47 (11)	C8—C9—H9	120.00
C5—C4—C9	119.09 (12)	C2—C10—H10A	109.00
C3—C4—C5	119.41 (11)	C2—C10—H10B	109.00
C4—C5—C6	120.66 (12)	C2—C10—H10C	109.00
C5—C6—C7	118.38 (12)	H10A—C10—H10B	109.00
N1—C7—C6	119.04 (11)	H10A—C10—H10C	110.00
N1—C7—C8	118.35 (11)	H10B—C10—H10C	109.00
C6—C7—C8	122.61 (12)		

O3—N1—C7—C6	−7.7 (2)	C2—C3—C4—C9	−44.9 (2)
O3—N1—C7—C8	172.34 (13)	C3—C4—C5—C6	−178.09 (13)
O4—N1—C7—C6	173.58 (14)	C9—C4—C5—C6	3.7 (2)
O4—N1—C7—C8	−6.4 (2)	C3—C4—C9—C8	179.06 (13)
O1—C1—C2—C3	3.07 (18)	C5—C4—C9—C8	−2.7 (2)

O1—C1—C2—C10	−174.99 (12)	C4—C5—C6—C7	−1.4 (2)
O2—C1—C2—C3	−176.04 (13)	C5—C6—C7—N1	178.15 (13)
O2—C1—C2—C10	5.90 (18)	C5—C6—C7—C8	−1.9 (2)
C1—C2—C3—C4	176.84 (12)	N1—C7—C8—C9	−177.24 (13)
C10—C2—C3—C4	−5.3 (2)	C6—C7—C8—C9	2.8 (2)
C2—C3—C4—C5	136.88 (15)	C7—C8—C9—C4	−0.4 (2)

Symmetry codes: (i) *x*, *y*−1, *z*; (ii) −*x*, −*y*+1, −*z*; (iii) −*x*, −*y*, −*z*+1; (iv) *x*, *y*−1, *z*+1; (v) −*x*, −*y*+1, −*z*+1; (vi) *x*, *y*+1, *z*−1; (vii) −*x*+1, −*y*+2, −*z*−1; (viii) −*x*+1, −*y*+2, −*z*; (ix) *x*, *y*+1, *z*; (x) −*x*+1, −*y*+1, −*z*.

Hydrogen-bond geometry (Å, º)

D—H···*A*	*D*—H	H···*A*	*D*···*A*	*D*—H···*A*
O1—H1···O2^{iii}	0.93 (2)	1.71 (2)	2.6333 (15)	177 (2)
C3—H3···O1	0.93	2.31	2.7080 (17)	105
C8—H8···O1^{ix}	0.93	2.55	3.3471 (17)	144
C9—H9···O2^{v}	0.93	2.60	3.4912 (17)	161

Symmetry codes: (iii) −*x*, −*y*, −*z*+1; (v) −*x*, −*y*+1, −*z*+1; (ix) *x*, *y*+1, *z*.