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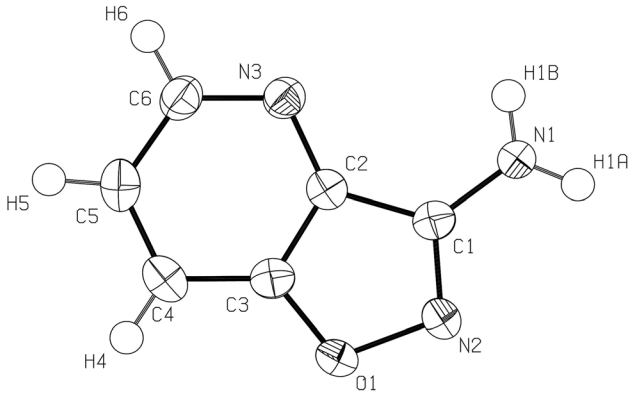
Crystal structure of isoxazolo[4,5-*b*]pyridin-3-amine, $C_6H_5N_3O$



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Abstract

$C_6H_5N_3O$, monoclinic, $P2_1/n$ (no. 14), a = 5.2140(2) Å, b = 6.8527(2) Å, c = 16.3538(5) Å, β = 97.335(3)°, V = 579.54(3) Å^3, Z = 4, $R_{gt}(F)$ = 0.0336, $wR_{ref}(F^2)$ = 0.0881, T = 293(2) K.

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Table 1 contains crystallographic data and Table 2 contains the list of the atoms including atomic coordinates and displacement parameters.

Table 1: Data collection and handling.

Crystal:	Colorless bulk
Size:	0.21 × 0.18 × 0.15 mm
Wavelength:	Cu *K*α radiation (1.54178 Å)
μ:	0.94 mm^{-1}
Diffractometer, scan mode:	ROD, Synergy Custom system, HyPix, ω
θ_{max}, completeness:	74.0°, 99 %
$N(hkl)_{measured}$, $N(hkl)_{unique}$, R_{int}:	2843, 1093, 0.014
Criterion for I_{obs}, $N(hkl)_{gt}$:	$I_{obs} > 2\sigma(I_{obs})$, 1,041
$N(param)_{refined}$:	92
Programs:	CrysAlis^{PRO},[1] SHELX[2,3]

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

Atom	*x*	*y*	*z*	U_{iso}*/U_{eq}
N1	0.7106 (2)	0.29988 (16)	0.49583 (7)	0.0195 (3)
H1A	0.735487	0.414601	0.516652	0.023*
H1B	0.589077	0.227413	0.510035	0.023*
N2	1.0504 (2)	0.33729 (16)	0.41684 (6)	0.0181 (3)
N3	0.67992 (19)	−0.10422 (15)	0.40688 (6)	0.0167 (3)
O1	1.16514 (17)	0.21960 (13)	0.35720 (5)	0.0193 (3)
C1	0.8615 (2)	0.23389 (18)	0.44113 (7)	0.0147 (3)
C2	0.8412 (2)	0.04600 (17)	0.40029 (7)	0.0143 (3)
C3	1.0341 (2)	0.04937 (18)	0.34964 (7)	0.0158 (3)
C4	1.0707 (2)	−0.10741 (19)	0.29833 (7)	0.0185 (3)
H4	1.195762	−0.107420	0.262569	0.022*
C5	0.9066 (2)	−0.26256 (19)	0.30476 (8)	0.0193 (3)
H5	0.920706	−0.373148	0.272675	0.023*
C6	0.7181 (2)	−0.25659 (18)	0.35906 (8)	0.0188 (3)
H6	0.613506	−0.365703	0.361807	0.023*

1 Source of materials

A round-bottom flask with three necks, fitted with a nitrogen inlet and a temperature probe, was initially charged with 12.20 g of 3-fluoropicolinonitrile (1.0 equivalent) and 9.08 g of acetohydroxamic acid (1.2 equivalents) in 65 mL of water at ambient temperature. Following this, a solution containing potassium carbonate (27.64 g, 2.0 equivalents) dissolved in 100 mL of water was introduced to the reaction mixture all at once. The mixture was stirred at 50 °C for a duration of 24 h. Upon completion of the reaction, the resulting crystalline slurry was cooled to 10 °C and allowed to mature for 6 h. The product was subsequently isolated by filtration, rinsed with water (2 × 50 mL), and dried under vacuum at 20 torr while maintaining a nitrogen atmosphere for 24 h. This process yielded 10.67 g of isoxazolo[4,5-*b*]pyridin-3-amine as a crystalline solid, corresponding to an isolated yield of 79 %.

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2 Experimental details

All hydrogen atoms were placed in idealized positions. Their U_{iso} values were set to 1.2 U_{eq} of the parent atoms.

3 Comment

Aminoisoxazoles represent crucial pharmacophores within biologically active and pharmaceutical compounds, also serving as valuable synthetic intermediates.[4–6] Notably, aromatic fused aminoisoxazoles, such as isoxazolo[4,5-*b*] pyridin-3-amine, hold considerable significance due to their extensive investigation and diverse biological activities. For example, a study by Balog and colleagues delineated a novel class of isoxazolo[4,5-*b*]pyridin-3-amine derivatives, which exhibit promising potential for the treatment of diseases linked to CYP17.c[7]

The crystal structure of isoxazolo[4,5-*b*]pyridin-3-amine is shown in the figure. The bond lengths of C1–N1, C1=N2 and N2–O1 in the title molecule are 1.343, 1.315 and 1.452 Å, respectively, which are similar with its analogs.[8,9] The angle between the five-membered aminoisoxazole-ring consisting of (C1, C2, C3, O1, N2) and six-membered pyridine-ring consisting of (C2, C3, C4, C5, C6, N3) is 0.82°. Besides, the distance between two adjacent molecules in parallel arrangement is 3.3 Å, indicating π–π stacking interaction between the aromatic cycles. The bond lengths and angles are all in the expected ranges.

Author contribution: Litong Wang and Jinfang Wang are co-first authors, having made equal contributions to this work. All the authors have accepted responsibility for the entire content of this submitted manuscript and approved submission.

Conflict of interest: The authors declare no conflicts of interest regarding this article.

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