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2-{(*E*)-[(2-Hydroxy-1-phenylethyl)imino]methyl}-4-[(*E*)-(4-methylphenyl)diazenyl]phenol

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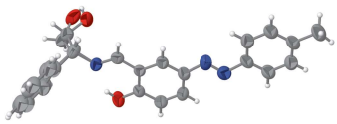
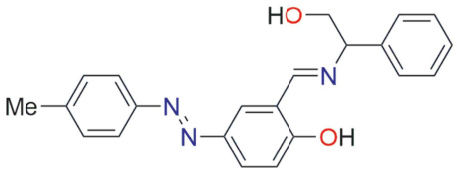
Structural data: full structural data are available from iucrdata.iucr.org

In the title compound, $C_{22}H_{21}N_3O_2$, an intramolecular O—H···N hydrogen bond is observed between the phenol and methanimine groups of the molecule. The 2-phenylethan-1-ol part is disordered over two orientations [occupancies 0.566 (17) and 0.434 (17)]. In the crystal, disordered intermolecular O—H···O hydrogen bonds between adjacent molecules form chains parallel to the *b* axis.

3D view



Chemical scheme



Structure description

Primary amines react with azo compounds, along with aldehydes or ketones, to yield azo-Schiff bases (Su *et al.*, 2015). Azo-Schiff bases serve as chelating ligands in coordination chemistry, where they form complexes with different metal ions that can be applied in catalysis and materials science (Kargar *et al.*, 2022). Studies in the pharmaceutical sector have shown that azo-Schiff bases possess significant biological activities, including antimicrobial (da Silva *et al.*, 2011), antioxidant (Hameed *et al.*, 2017), and anticancer (El-Sonbati *et al.*, 2015) effects. Their potential for interaction with biological targets like enzymes and DNA has paved the way for new drug development approaches (Kaswan, 2023). Moreover, the ability of the azo group to function as a free radical scavenger boosts its potential in addressing oxidative stress-related disorders (Su *et al.*, 2015). This work details the synthesis and crystal structure of an azo-Schiff base.

The asymmetric unit of the crystal structure comprises one molecule of the title compound (Fig. 1). The molecule consists of a (tolyldiazenyl)phenol segment (C1-C12/C22/N1/N2/O1) linked to a 2-phenylethan-1-ol segment (C14–C21/O2) by a methanimine group (C13, N3). The (tolyldiazenyl)phenol and methanimine segments are almost co-planar [torsion angle C8—C9—C13—N3 is 178.9 (3)°]. The 2-phenylethan-1-ol part is disordered over two orientations [occupancies 0.566 (17) for component containing O2,