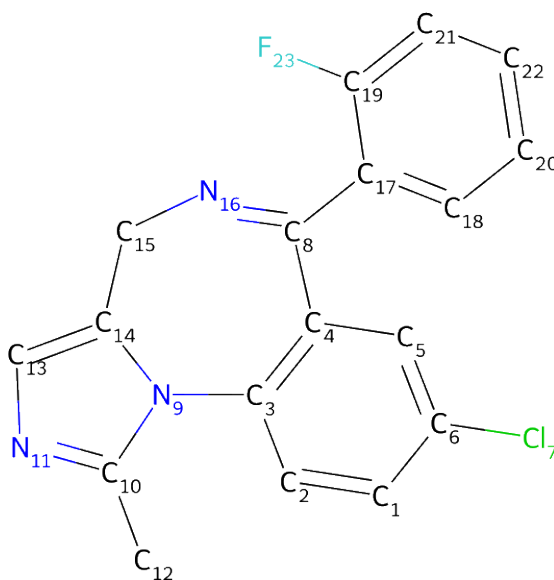


# C-oxidation BDE Energy Report for: 200\_midazolam-out

This report covers the results for bond dissociation enthalpies (BDE) and solvent accessible surface area (SASA) calculations performed for 200\_midazolam-out. Oxidation propensity is established using C-H BDE. The lower the C-H BDE values the higher the propensity for C-oxidation. Details for the density functional theory (DFT) calculations and overall workflow are explained at the end of this document.

## BDE and SASA



Atom	BDE (kcal/mol)	Propensity	SASA (Å <sup>2</sup> )
C1	114.13	Low	0.33
C2	112.09	Low	0.00
C5	113.24	Low	1.48
C12	87.12	High	0.09
C13	116.75	Low	5.12
C15	73.4	High	0.09
C18	113.72	Low	4.42
C20	113.21	Low	0.01
C21	115.0	Low	4.24
C22	112.72	Low	0.68

**Missing Sites:**

None

***Risk Scale:***



**Calculation Details**

Conformational search calculations were performed only for the base ground state molecule. The lowest energy conformer was selected to generate radicals and run optimization DFT calculations. DFT calculations were performed using Gaussian with B3LYP level of theory and 6-31G(d,p) basis set. The BDE protocol was adapted from: *Lienard, P., Gavartin, J., Boccardi, G., & Meunier, M. (2015). Predicting drug substances autoxidation. Pharmaceutical research, 32, 300-310.*