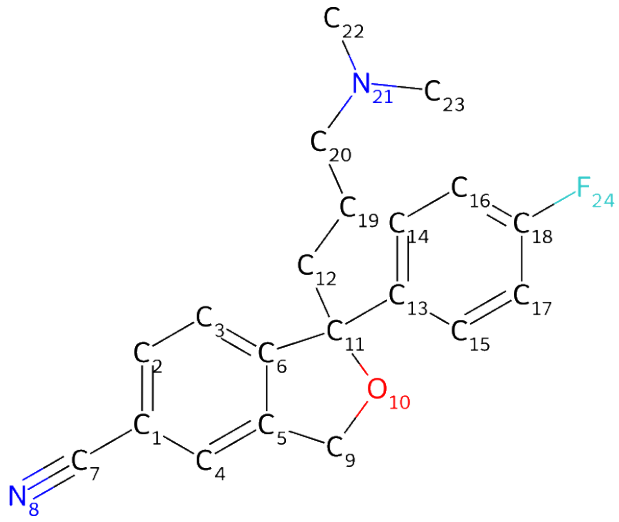
C-oxidation BDE Energy Report for: 085_citalopram-out

This report covers the results for bond dissociation enthalpies (BDE) and solvent accessible surface area (SASA) calculations performed for 085_citalopram-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

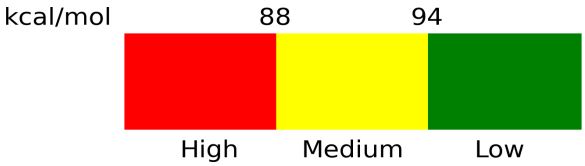


Atom	BDE (kcal/mol)	Propensity
C2	114.14	Low
C3	111.92	Low
C4	113.87	Low
C9	80.22	High
C12	97.61	Low
C14	110.39	Low
C15	112.58	Low
C16	114.73	Low
C17	114.57	Low
C19	97.42	Low
C20	91.18	Moderate
C22	92.67	Moderate
C23	92.9	Moderate

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.*