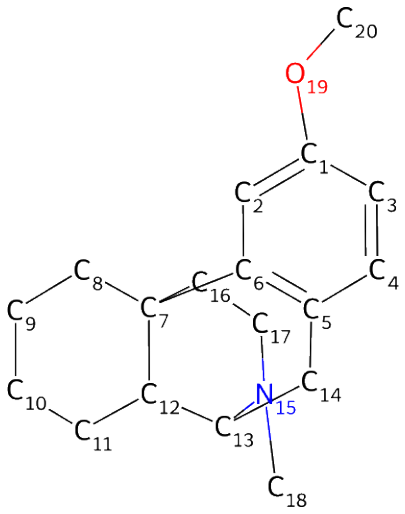
C-oxidation BDE Energy Report for: 109_dextromethorphan-out

This report covers the results for bond dissociation enthalpies (BDE) and solvent accessible surface area (SASA) calculations performed for 109_dextromethorphan-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



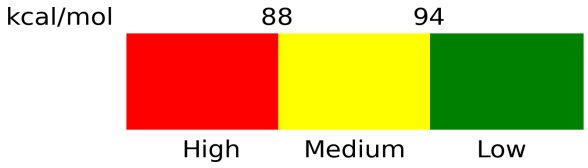
Atom	BDE (kcal/mol)	Propensity	SASA (Å²)
C2	111.94	Low	0.00
C3	111.98	Low	0.00
C4	111.25	Low	0.00
C8	97.17	Low	0.53
C9	98.09	Low	16.71
C10	98.02	Low	0.00
C11	97.25	Low	0.00
C12	97.31	Low	0.00
C13	96.04	Low	0.41
C14	83.08	High	1.94
C16	98.46	Low	5.33
C17	89.35	Moderate	21.86
C18	90.78	Moderate	14.76

C20	96.62	Low	1.30

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.*