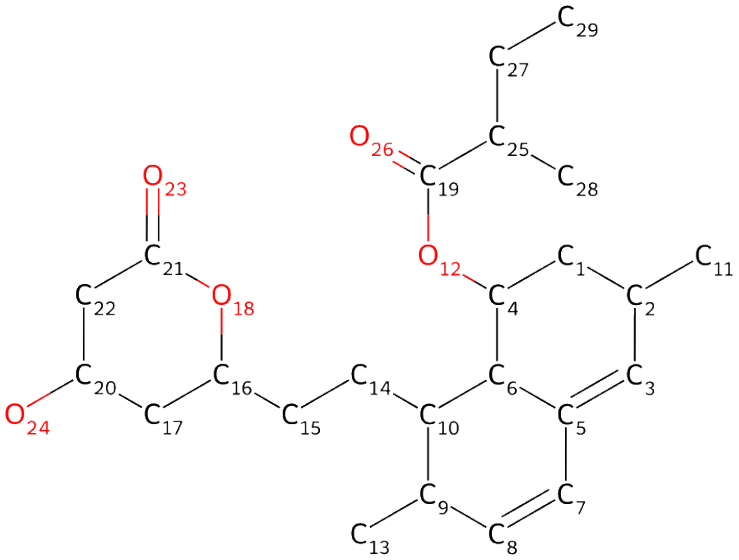
C-oxidation BDE Energy Report for: 189_lovastatin-out

This report covers the results for bond dissociation enthalpies (BDE) and solvent accessible surface area (SASA) calculations performed for 189_lovastatin-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



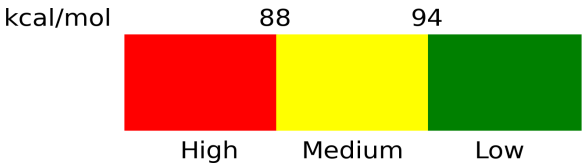
Atom	BDE (kcal/mol)	Propensity	SASA (Å²)
C1	97.15	Low	0.33
C2	70.82	High	0.00
C3	109.16	Low	5.97
C4	97.4	Low	0.00
C6	81.17	High	0.00
C7	109.92	Low	11.35
C8	109.41	Low	7.26
C9	77.94	High	0.00
C10	94.92	Low	0.00
C11	101.68	Low	5.19
C13	100.63	Low	5.12
C14	97.31	Low	0.02

C15	97.87	Low	0.09
C16	91.0	Moderate	0.00
C17	97.52	Low	0.61
C20	91.22	Moderate	0.01
C22	91.66	Moderate	0.68
C25	85.89	High	0.00
C27	96.25	Low	0.35
C28	101.69	Low	4.21
C29	100.34	Low	5.13

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.*