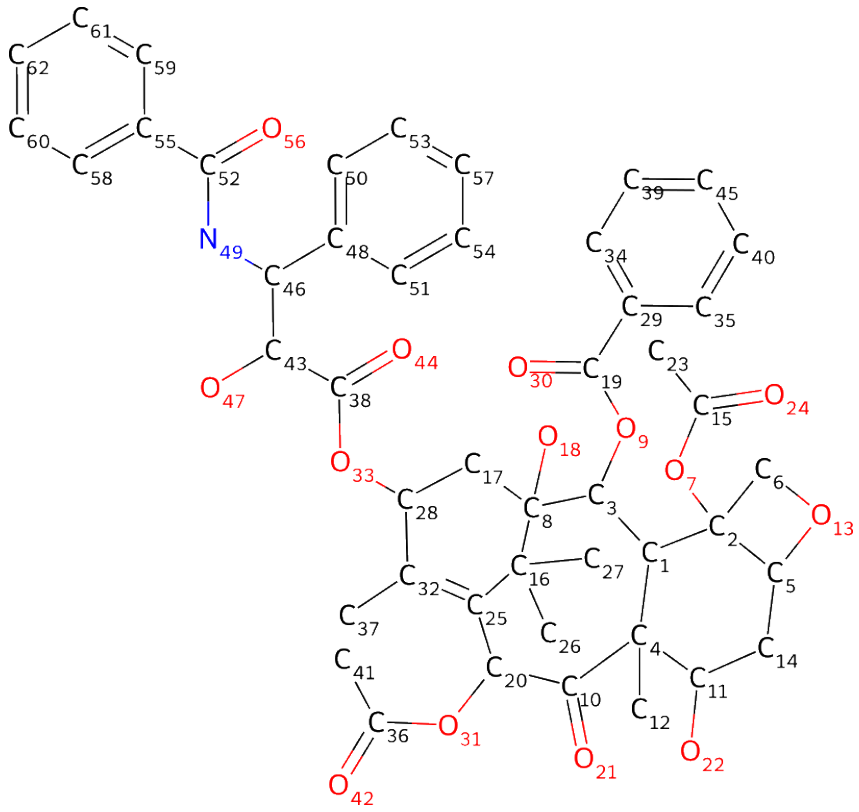
C-oxidation BDE Energy Report for: TAXOL

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



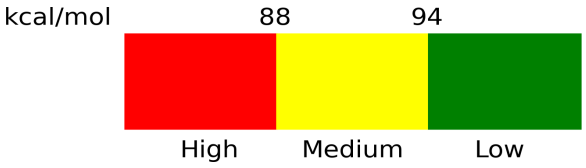
Atom	BDE (kcal/mol)	Propensity	SASA (Å²)
C1	72.35	High	1.77
C3	87.87	High	0.0
C5	95.73	Low	7.28
C6	93.34	Moderate	17.01
C11	92.32	Moderate	0.0
C12	99.42	Low	13.31
C14	96.03	Low	11.12
C17	93.91	Moderate	3.24

C20	80.73	High	0.27
C23	96.09	Low	23.65
C26	97.96	Low	15.34
C27	96.05	Low	11.52
C28	74.76	High	3.66
C34	114.25	Low	0.0
C35	111.45	Low	9.22
C37	85.01	High	9.19
C39	112.76	Low	26.79
C40	112.63	Low	19.15
C41	97.65	Low	31.51
C43	86.03	High	0.63
C45	112.55	Low	28.06
C46	85.22	High	5.15
C51	109.79	Low	9.34
C53	112.31	Low	31.48
C54	112.21	Low	29.36
C57	112.7	Low	34.98
C58	114.32	Low	20.33
C59	110.16	Low	6.82
C60	112.35	Low	34.11
C61	112.66	Low	30.38
C62	112.38	Low	34.75

Missing Sites:

C50.

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.