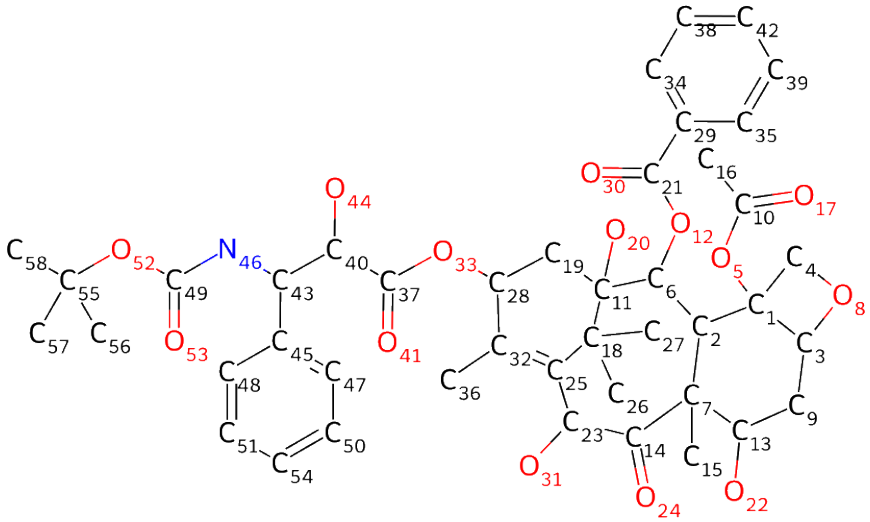
C-oxidation BDE Energy Report for: 118_docetaxel-out

This report covers the results for bond dissociation enthalpies (BDE) and solvent accessible surface area (SASA) calculations performed for 118_docetaxel-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



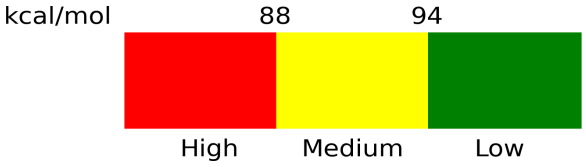
Atom	BDE (kcal/mol)	Propensity
C2	90.15	Moderate
C3	91.12	Moderate
C4	94.51	Low
C6	92.75	Moderate
C9	96.75	Low
C13	89.53	Moderate
C15	101.03	Low
C16	97.68	Low
C19	93.81	Moderate
C23	75.47	High
C26	99.24	Low
C27	96.01	Low

C28	73.66	High
C34	114.22	Low
C35	112.92	Low
C36	84.93	High
C38	112.56	Low
C39	112.35	Low
C40	83.49	High
C42	112.35	Low
C43	84.53	High
C47	112.09	Low
C50	112.33	Low
C51	112.15	Low
C54	112.71	Low
C56	103.7	Low
C57	103.7	Low
C58	103.7	Low

Missing Sites:

C48.

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.*