Subject: Export of Chiral compounds
Posted by andys on Thu, 01 Oct 2020 23:18:41 GMT
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Hello

I have a problem with exporting the results from a Enumerate Combinatorial Library process with racemic centres been described as single chiral forms. The problem is I have a set of chirally pure compounds for reagent set 1 and a set of racemates for reagent set 2, the enumeration process works fine and the products have a chirally resolved atom from reagent set 1 a racemic atom from reagent set 2. Within Datawarrior the bonds are reported correctly as specified chirality and racemic. However, when I export the molecules as an SD file all the chiral centres are classed as resolved and the chirality flags for the racemic atom set in the bond block of the SD file as either 1 or 6 (this seems arbitory) rather than the correct assignment of 4.

Subject: Re: Export of Chiral compounds
Posted by thomas on Fri, 02 Oct 2020 09:00:21 GMT
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DataWarrior and OpenChemLib don't use the 'either' bond, but uses the 'chiral flag' to specify whether the molecule is racemic or not. For molecules with one racemic stereo center DataWarrior writes a V2000 molfile with up or down bond (1 or 6) and chiral flag = 0, which makes it a racemic molecule. If you have multiple racemic stereo centers all in the same group, that is with given relative configuration, then up/down bonds are necessary to not loose the relative stereo information. Still the chiral flag defines, whether we have a racemate or a pure diastereomer. If multiple racemic stereocenters are in independent groups, then the molfile V2000 cannot represent this anymore. I can only suggest using V3000 when you need to export and only use software that supports MDL's concept of 'enhanced stereo representation'. In this context SMILES are even worse, because they cannot even distinguish relative from absolute stereo centers, i.e. racemates from pure diastereomers.

The molfile bond stereo value 4 seems to leave room for interpretation and does not necessarily mean racemic. The MDL ctfiles specification says for the bond stereo field:
"Single bonds: 4 = Either, Double bonds: 3 = Cis or trans (either) double bond"
From this I conclude that 4 for single bonds may means (or at least may mean) up or down.

Hope this explains it,

Thomas