

## NAME

SDFFileUtil

## SYNOPSIS

```
use SDFFileUtil ;

use SDFFileUtil qw(:all);
```

## DESCRIPTION

SDFFileUtil module provides the following functions:

GenerateCmpdAtomAliasPropertyLines, GenerateCmpdAtomLine, GenerateCmpdBondLine, GenerateCmpdChargePropertyLines, GenerateCmpdCommentsLine, GenerateCmpdCountsLine, GenerateCmpdDataHeaderLabelsAndValuesLines, GenerateCmpdIsotopePropertyLines, GenerateCmpdMiscInfoLine, GenerateCmpdMolNameLine, GenerateCmpdRadicalPropertyLines, GenerateEmptyCtabBlockLines, GenerateMiscLineDateStamp, GetAllAndCommonCmpdDataHeaderLabels, GetCmpdDataHeaderLabels, GetCmpdDataHeaderLabelsAndValues, GetCmpdFragments, GetCtabLinesCount, GetInvalidAtomNumbers, GetUnknownAtoms, InternalBondOrderToMDLBondType, InternalBondStereochemistryToMDLBondStereo, InternalChargeToMDLCharge, InternalSpinMultiplicityToMDLRadical, IsCmpd2D, IsCmpd3D, MDLBondStereoToInternalBondStereochemistry, MDLBondTypeToInternalBondOrder, MDLChargeToInternalCharge, MDLRadicalToInternalSpinMultiplicity, ParseCmpdAtomAliasPropertyLine, ParseCmpdAtomLine, ParseCmpdBondLine, ParseCmpdChargePropertyLine, ParseCmpdCommentsLine, ParseCmpdCountsLine, ParseCmpdIsotopePropertyLine, ParseCmpdMiscInfoLine, ParseCmpdMolNameLine, ParseCmpdRadicalPropertyLine, ReadCmpdString, RemoveCmpdDataHeaderLabelAndValue, WashCmpd

## METHODS

## GenerateCmpdAtomAliasPropertyLines

```
@Lines = GenerateCmpdAtomAliasPropertyLines($AliasValuePairsRef);
```

Returns a formatted atom alias property lines corresponding to successive pairs of atom number and alias values specified by a reference to an array. Two lines are generate for each atom number and alias value pairs: First line - A <AtomNum>; Second line: <AtomAlias>.

## GenerateCmpdAtomLine

```
$Line = GenerateCmpdAtomLine($AtomSymbol, $AtomX, $AtomY,
                             $AtomZ, [$MassDifference, $Charge, $StereoParity]);
```

Returns a formatted atom data line containing all the input values.

## GenerateCmpdBondLine

```
$Line = GenerateCmpdBondLine($FirstAtomNum, $SecondAtomNum,
                             $BondType, [$BondStereo]);
```

Returns a formatted bond data line containing all the input values.

## GenerateCmpdChargePropertyLines

```
@Lines = GenerateCmpdChargePropertyLines($ChargeValuePairsRef);
```

Returns a formatted M CHG property lines corresponding to successive pairs of atom number and charge values specified by a reference to an array.

## GenerateCmpdCommentsLine

```
$Line = GenerateCmpdCommentsLine($Comments);
```

Returns a formatted comments data line.

## GenerateCmpdCountsLine

```
$Line = GenerateCmpdCountsLine($AtomCount, $BondCount,
                               $ChiralFlag, [$PropertyCount, $Version]);
```

Returns a formatted line containing all the input values. The default values of 999 and V2000 are used for *PropertyCount* and *Version*.

## GenerateCmpdDataHeaderLabelsAndValuesLines

```
@Lines = GenerateCmpdDataHeaderLabelsAndValuesLines(
```

```
$DataHeaderLabelsRef, $DataHeaderLabelsAndValuesRef,
[$SortDataLabels]);
```

Returns formatted data lines containing header label and values lines corresponding to all data header labels in array reference *DataHeaderLabelsRef* with values in hash reference *DataHeaderLabelsAndValuesRef*. By default, data header labels are not sorted and correspond to the label order in array reference *DataHeaderLabelsRef*.

#### GenerateCmpdIsotopePropertyLines

```
@Lines = GenerateCmpdIsotopePropertyLines($IsotopeValuePairsRef);
```

Returns a formatted M ISO property lines corresponding to successive pairs of atom number and isotope values specified by a reference to an array.

#### GenerateCmpdMiscInfoLine

```
$Line = GenerateCmpdMiscInfoLine([$ProgramName, $UserInitial,
$Code]);
```

Returns a formatted line containing specified user initial, program name, date and code. Default values are: *ProgramName* - *MayaChem*; *UserInitial* - *NULL*; *Code* - *2D*.

#### GenerateCmpdMolNameLine

```
$Line = GenerateCmpdMolNameLine($MolName);
```

Returns a formatted molecule name data line.

#### GenerateCmpdRadicalPropertyLines

```
@Lines = GenerateCmpdRadicalPropertyLines($RadicalValuePairsRef);
```

Returns a formatted M CHG property lines corresponding to successive pairs of atom number and multiplicity values specified by a reference to an array.

#### GenerateEmptyCtabBlockLines

```
$Lines = GenerateCmpdMiscInfoLine([$Date]);
```

Returns formatted lines representing empty CTAB block.

#### GenerateMiscLineDateStamp

```
$Line = GenerateMiscLineDateStamp();
```

Returns date stamp for misc line.

#### GetAllAndCommonCmpdDataHeaderLabels

```
($CmpdCount, $DataFieldLabelsArrayRef,
$CommonDataFieldLabelsArrayRef) =
GetAllAndCommonCmpdDataHeaderLabels(\*SDFILE);
```

Returns number of compounds, a reference to an array containing all unique data header label and a reference to an array containing common data field labels for all compounds in SD file.

#### GetCmpdDataHeaderLabels

```
(@Labels) = GetCmpdDataHeaderLabels(\@CmpdLines);
```

Returns an array containing data header labels for a compound

#### GetCmpdDataHeaderLabelsAndValues

```
(%DataValues) = GetCmpdDataHeaderLabelsAndValues(\@CmpdLines);
```

Returns a hash containing data header labels and values for a compound.

#### GetCmpdFragments

```
($FragmentCount, $FragmentString) = GetCmpdFragments(\@CmpdLines);
```

Figures out the number of disconnected fragments and return their values along with the atom numbers in a string delimited by new line character. Fragment data in *FragmentString* is sorted on based on its size.

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**GetCtabLinesCount**

```
$CtabLinesCount = GetCtabLinesCount(\@CmpdLines);
```

Returns number of lines present between the 4th line and the line containing "M END".

**GetInvalidAtomNumbers**

```
($InvalidAtomNumbersCount, $InvalidAtomNumbers, $InvalidAtomNumberLines) =  
  GetInvalidAtomNumbers(\@CmpdLines);
```

Returns a list of values containing information about invalid atom numbers present in block or atom property lines.

**GetUnknownAtoms**

```
($UnknownAtomCount, $UnknownAtoms, $UnknownAtomLines) =  
  GetUnknownAtoms(\@CmpdLines);
```

Returns a list of values containing information about atoms which contain special element symbols not present in the periodic table.

**InternalBondOrderToMDLBondType**

```
$MDLBondType = InternalBondOrderToMDLBondType($InternalBondOrder);
```

Returns value of *MDLBondType* corresponding to *InternalBondOrder*.

InternalBondOrder	MDLBondType
1	1
2	2
3	3
1.5	4

**InternalBondStereochemistryToMDLBondStereo**

```
$MDLBondStereo = InternalBondStereochemistryToMDLBondStereo(  
  $InternalBondStereo);
```

Returns value of *MDLBondStereo* corresponding to *InternalBondStereo* using following mapping:

InternalBondStereo	MDLBondStereo
Up	1
UpOrDown	4
Down	6
CisOrTrans	3
Other	0

**InternalChargeToMDLCharge**

```
$MDLCharge = InternalChargeToMDLCharge($InternalCharge);
```

Returns value of *MDLCharge* corresponding to *InternalCharge* using following mapping:

InternalCharge	MDLCharge
3	1
2	2
1	3
-1	5
-2	6
-3	7

**InternalSpinMultiplicityToMDLRadical**

```
$MDLRadical = InternalSpinMultiplicityToMDLRadical(  
  $InternalSpinMultiplicity);
```

Returns value of *MDLRadical* corresponding to *InternalSpinMultiplicity*. These value are equivalent.

**MDLBondStereoToInternalBondType**

```
$InternalBondType = MDLBondStereoToInternalBondType($MDLBondStereo);
```

Returns value of *InternalBondType* corresponding to *MDLBondStereo* using mapping shown for InternalBondTypeToMDLBondStereo function.

#### IsCmpd2D

```
$Status = IsCmpd2D();
```

Returns 1 or 0 based on whether z-coordinate of any atom is non-zero.

#### IsCmpd3D

```
$Status = IsCmpd3D();
```

Returns 1 or 0 based on whether z-coordinate of any atom is non-zero.

#### MDLBondStereoToInternalBondStereochemistry

```
$InternalBondStereo = MDLBondStereoToInternalBondStereochemistry(  
    $MDLBondStereo);
```

Returns value of *InternalBondStereo* corresponding to *MDLBondStereo* using mapping shown for InternalBondStereochemistryToMDLBondStereo function.

#### MDLBondTypeToInternalBondOrder

```
$InternalBondOrder = MDLBondTypeToInternalBondOrder($MDLBondType);
```

Returns value of *InternalBondOrder* corresponding to *MDLBondType* using mapping shown for InternalBondOrderToMDLBondType function.

#### MDLChargeToInternalCharge

```
$InternalCharge = MDLChargeToInternalCharge($MDLCharge);
```

Returns value of *InternalCharge* corresponding to *MDLCharge* using mapping shown for InternalChargeToMDLCharge function.

#### MDLRadicalToInternalSpinMultiplicity

```
$InternalSpinMultiplicity = MDLRadicalToInternalSpinMultiplicity(  
    $MDLRadical);
```

Returns value of *InternalSpinMultiplicity* corresponding to *MDLRadical*. These value are equivalent.

#### ParseCmpdAtomAliasPropertyLine

```
@AtomNumAndValuePairs = ParseCmpdAtomAliasPropertyLine(  
    $CurrentLine, $NexLine);
```

Parses atom alias property lines in CTAB generic properties block and returns an array with successive pairs of values corresponding to atom number and its alias.

#### ParseCmpdAtomLine

```
($AtomSymbol, $AtomX, $AtomY, $AtomZ, $MassDifference, $Charge,  
    $StereoParity) = ParseCmpdAtomLine($AtomDataLine);
```

Parses compound data line containing atom information and returns a list of values.

#### ParseCmpdBondLine

```
($FirstAtomNum, $SecondAtomNum, $BondType) =  
    ParseCmpdBondLine($BondDataLine);
```

Parses compound data line containing bond information and returns a list of values.

#### ParseCmpdCommentsLine

```
$Comments = ParseCmpdCommentsLine($CommentsDataLine);
```

Returns the comment string.

#### ParseCmpdChargePropertyLine

```
@AtomNumAndValuePairs = ParseCmpdChargePropertyLine(  
    $ChargeDataLine);
```

Parses charge property line in CTAB generic properties block and returns an array with successive pairs of values corresponding to atom number and its charge.

#### ParseCmpdCountsLine

```
($AtomCount, $BondCount, $ChiralFlag, $PropertyCount, $Version) =  
  ParseCmpdCountsLine(\@CountDataLines);
```

Returns a list of values containing count information.

#### ParseCmpdMiscInfoLine

```
($UserInitial, $ProgramName, $Date, $Code, $ScalingFactor1, $ScalingFactor2,  
  $Energy, $RegistryNum) = ParseCmpdMiscInfoLine($Line);
```

Returns a list of values containing miscellaneous information.

#### ParseCmpdIsotopePropertyLine

```
@AtomNumAndValuePairs = ParseCmpdIsotopePropertyLine(  
  $IsotopeDataLine);
```

Parses isotopic property line in CTAB generic properties block and returns an array with successive pairs of values corresponding to atom number and absolute mass of atom isotope.

#### ParseCmpdMolNameLine

```
$MolName = ParseCmpdMolNameLine($Line);
```

Returns a string containing molecule name.

#### ParseCmpdRadicalPropertyLine

```
@AtomNumAndValuePairs = ParseCmpdRadicalPropertyLine(  
  $RadicalDataLine);
```

Parses radical property line in CTAB generic properties block and returns an array with successive pairs of values corresponding to atom number and radical number value.

#### RemoveCmpdDataHeaderLabelAndValue

```
$NewCmpdString = RemoveCmpdDataHeaderLabelAndValue($CmpdString,  
  $DataHeaderLabel);
```

Returns a NewCmpdString after removing *DataHeaderLabel* along with its value from *CmpdString*.

#### ReadCmpdString

```
$CmpdString = ReadCmpdString(\*SDFILEHANDLE);
```

Returns a string containing all the data lines for the next available compound in an already open file indicated by SDFILEHANDLE. A NULL string is returned on EOF.

#### WashCmpd

```
($FragmentCount, $Fragments, $WashedCmpdString) =  
  WashCmpd(\@CmpdLines);
```

Figures out the number of disconnected fragments and return their values along with the atom numbers in a string delimited by new line character. Fragment data in FragmentString is sorted on based on its size.

#### AUTHOR

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#### SEE ALSO

TextUtil.pm

#### COPYRIGHT

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