TECHNICAL REPORT N° 44 **July 2001**

NOMENCLATURE

Current CD spectrometers measure CD in terms of ellipticity Θ, usually expressed in millidegrees.
This is, if you want, a rather strange way to express results, since CD is an absorption phenomena. Indeed the French school, which developed first commercial units, was using ΔOD as scale, but Americans took over many years ago and ellipticity Θ is the standard acquisition scale used today. Conversion is however very simple:

$\Delta A = \Theta/32980$
where:
ΔA in absorbance units
Θ is ellipticity in mdeg

Literature data are usually reported in **molar ellipticity [Θ]**:
$[\Theta] = \Theta/(10xCxl)$ or **$[\Theta] = (\Theta xM)/(cx\ lx10000)$**
where:
Θ is ellipticity in mdeg M is molecular weight
C is the molar concentration (mole/l) c is concentration in g/ml
l is the cell path in cm

since obviously
$C = (1000xc)/M$
[Θ] is expressed in deg x cm^2 x $decimole^{-1}$

For macromolecules such as proteins the mean residue molar ellipticity is used $[\Theta]_{MRW}$:
$[\Theta]_{MRW} = \Theta/(10xC_rxl)$
Formula is still the same, but C_r is the mean residue molar concentration
$C_r = (nx1000xc_g)/M_r$
where:
n is the number of peptide bonds (residue)
c_g is the macromolecule concentration (g/ml)
M_r is the molecular weight of the species

Notes:
-the Jasco software is not able to differentiate [Θ] from $[\Theta]_{MRW}$, so inputting concentration you must divide by the number of amino acids
-Jasco uses molecular ellipticity term in place of molar ellipticity
-most secondary structure estimation programs need $[\Theta]_{MRW}$

Another used way to report data in literature is **molar circular dichroism Δε**:
$\Delta\varepsilon = \varepsilon_L - \varepsilon_R = \Delta A/Cxl$
simple relations apply:
$[\Theta] = 3298x\Delta\varepsilon$ and **$\Delta\varepsilon = [\Theta]/3298$**
$\Delta\varepsilon_{MRW}$ is often used for macromolecules as mean residue molar circular dichroism, same rules as above
Note:
-Jasco software indicates Δε as molecular CD

Furthermore data are occasionally expressed as anisotropy factor **g**
$g = \Delta\varepsilon/\varepsilon = \Delta A/A$
which is independent from concentration and linearly related to the enantiomeric excess

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