DCHA-Iso, ICS-I3

ICS-I3 is a purified preparation of the dicyclohexylamine salts of *trans*-iso-α-acids. It is deemed to have a total iso-α-acids content of 62.3% (w/w), though this figure takes into account only the major forms of the iso-α-acids that are present: *trans*-isocohumulone, *trans*-isohumulone and *trans*-isoadhumulone. (N.B. Worts and beers brewed with hops, hop extracts, pellets and all commercial "Iso" products invariably also contain substantial proportions of the corresponding *cis*-iso-α-acids - see User's Guide supplied with the standard).

If you are using the recommended method, expect the area of the *trans*-isocohumulone peak to be about 33.6% of the total peak area of all of the compounds included in the calibration. (**Caution:** This may not be the case for methods that use other mobile phases, or for measurement at different wavelengths).

ICS-I3 replaces ICS-I2. The new standard has been cross-checked against the old and will give similar results.

DCHA-Rho, ICS-R2

ICS-R2 is a purified preparation of the dicyclohexylamine salts of *cis*-ρ-iso-α-acids. This standard is deemed to have a total ρ-iso-α-acids content of 65.3% (w/w), though this figure takes into account only the major forms of the ρ-iso-α-acids that are present: two *cis*-ρ-isocohumulones, two *cis*-ρ-isohumulones and two *cis*-ρ-isoadhumulones. (N.B. Commercial "Rho" products typically contain a significant proportion of a trans-ρ-isohumulone isomer - see User's Guide supplied with the standard).

If you are using the recommended method, expect the combined area of the *cis*-ρ-isocohumulones peaks* to be about 14.5% of the total peak area of all of the compounds included in the calibration. (**Caution**: This may not be the case for methods that use other mobile phases, or for measurement at different wavelengths).

ICS-R2 replaces ICS-R1. The new standard has been cross-checked against the old and has an essentially identical response factor per unit of total *cis*-ρ-iso-α-acids.

** The supplied chromatogram shows two peaks, corresponding to the two cis forms of this particular iso-α-acid. However, it is not known which peak corresponds to which of the two forms shown below. (The same is also true for the ρ-isohumulones peaks).*

Tetra, ICS-T2

ICS-T2 is a purified preparation containing both *cis*- and *trans*-isomers of the tetrahydroisocohumulones, tetrahydroisohumulones and tetrahydroisoadhumulones. In respect of these six isomers it is deemed to have a total tetrahydroiso-α-acids content of 99.4% (w/w).

If you are using the recommended method, expect the (combined) area of the tetrahydroisocohumulones peak(s)* to be about 39% of the total peak area of all of the compounds included in the calibration. (**Caution:** This may not be the case for methods that use other mobile phases, or for measurement at different wavelengths).

ICS-T2 replaces ICS-T1. The new standard has a much higher *cis:trans* ratio than the old and this may result in a small reduction (typically 1 - 2% relative) to the value obtained for "total Tetra" in an unknown sample.

** The supplied chromatogram shows only one peak. However, it is often found that the two isomers of tetrahydroisocohumulone are partially resolved.*

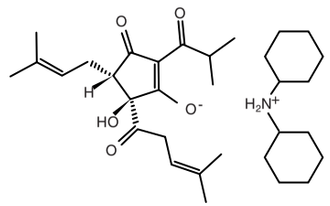
DCHA-Hexa, ICS-H1

ICS-H1 is a purified preparation of the dicyclohexylamine salts of *cis*-hexahydroiso-α-acids. It is deemed to have a total hexahydroiso-a-acids content of 65.7% (w/w), though this figure takes into account only the major forms of hexahydroiso-α-acids that are present: two *cis*-hexahydroisocohumulones, two *cis*-hexahydroisohumulones and two *cis*-hexahydroisoadhumulones.

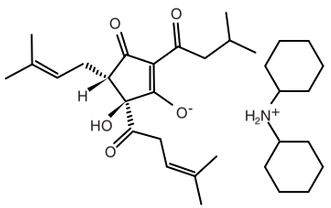
If you are using the recommended method, expect the combined areas of the *cis*-hexahydroisocohumulones peaks* to be about 53% of the total peak area of all of the compounds included in the calibration. (**Caution**: This may not be the case for methods that use other mobile phases, or for measurement at different wavelengths).

** The supplied chromatogram shows two peaks, corresponding to the two cis forms of this particular iso-α-acid. However, it is not known which peak corresponds to which of the two forms shown above. (The same is also true for the ρ-isohumulones peaks).*

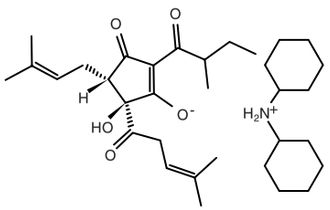
Structures of DCHA-Iso-alpha-acids



DCHA - *trans*-Isocohumulone
$C_{32}H_{51}NO_5$
(mw 529.751)

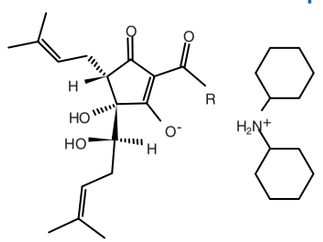


DCHA - *trans*-Isohumulone
$C_{33}H_{53}NO_5$
(mw 543.778)

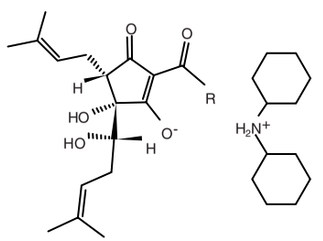


DCHA - *trans*-Isoadhumulone
$C_{33}H_{53}NO_5$
(mw 543.778)

Structures of DCHA-*rho*-Iso-alpha-acids



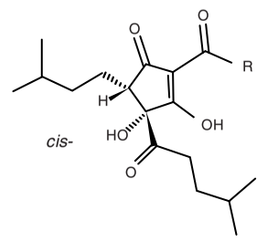
DCHA-Rho, ICS-R2
(contains two *cis* forms of each *rho*-iso-α-acid)



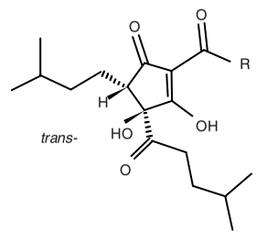
DCHA-*rho*-isocohumulones
$C_{32}H_{53}NO_5$
(mw 531.765)

DCHA-*rho*-isohumulones & isoadhumulones
$C_{33}H_{55}NO_5$
(mw 545.791)

Structures of Tetrahydroiso-alpha-acids



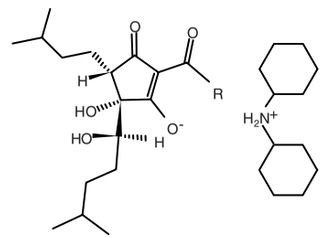
Tetra, ICS-T2
(contains both *cis* & *trans* forms of tetrahydroiso-α-acids)



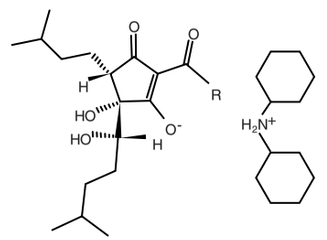
Tetrahydroisocohumulones
$C_{20}H_{32}O_5$
(mw 352.464)

Tetrahydroisohumulones & Tetrahydroisoadhumulones
$C_{21}H_{34}O_5$
(mw 366.490)

Structures of DCHA-Hexahydroiso-alpha-acids



DCHA-Hexa, ICS-H1
(contains two *cis* forms of each hexahydroiso-α-acid)



DCHA-hexahydroisocohumulones
$C_{32}H_{57}NO_5$
(mw 535.796)

DCHA-hexahydroisohumulones & isoadhumulones
$C_{33}H_{59}NO_5$
(mw 549.823)