

International Calibration Standards

for HPLC Analysis of Humulones

page 1 of 3

DCHA-Humulones, ICS-A1

ICS-A1 is a purified preparation of the dicyclohexylamine salts of α -acids.

Total α -acids : 64.8 % (w/w)

The above concentration was determined by the International Hop Standards Committee (IHSC) and takes into account only the three major forms of the α -acids that are present: *cohumulone*, *humulone* and *adhumulone*.

ICS-A1 is especially suited for the analysis of α -acids in beers (especially in dry hopped and late hopped beers). For the analysis of α -acids in hops it is still recommended to use the ICE-4, as it is more representative of the range of compounds found in hops. HPLC analyses should be done using the recommended method of ASBC HOPS-14 or EBC 7.7 at a wavelength of 314 nm.

When using ICS-A1 for the calibration of HPLC, first determine the total area of the peaks corresponding to the above-mentioned three compounds on each of your calibration runs, then set the integrator by calculating and applying the same response factor to each one of the peaks. Note: under most chromatographic conditions, there are only two major peaks as humulone and adhumulone coelute.

If you are using the recommended method of HOPS-14 or EBC 7.7, expect the area of the cohumulone peak to be about 26.4% of the total peak area of all three HPLC peaks included in the calibration. (Caution: This may not be the case for methods that use other mobile phases or for measurement at different wavelengths).

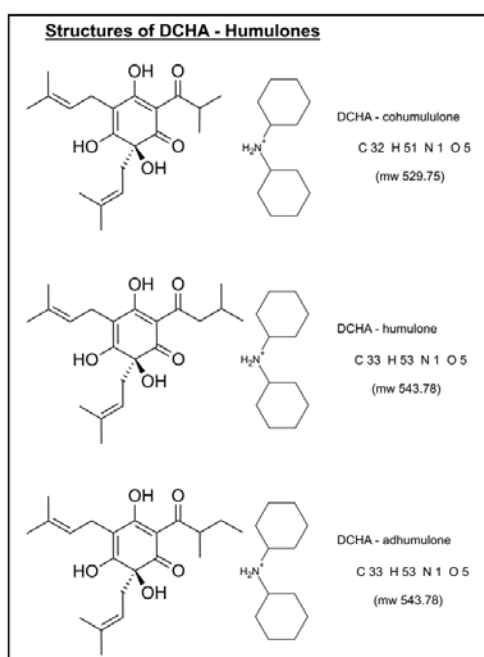
The following two chromatograms (of a single analysis) illustrate (page 2) the major peaks upon which the calibration must be based and (page 3) the minor peaks that are also present in the preparation. The spectra of all the peaks, as obtained from a photo-diode array (PDA) detector scanning at the peak maxima, are also shown.

Storage: -20 °C, gas-tight under CO₂ or N₂

Not for human consumption. Intended use is for industrial and analytical purposes

Country of origin/produced: USA

Rev. 01/May 2020



International Calibration Standards

for HPLC Analysis of Humulones

page 2 of 3

DCHA:α-Acids ICS-A1

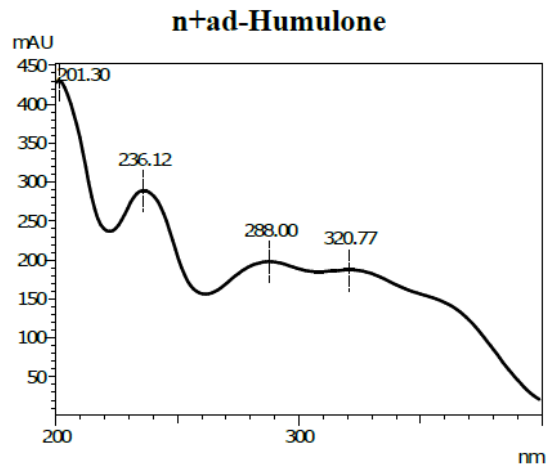
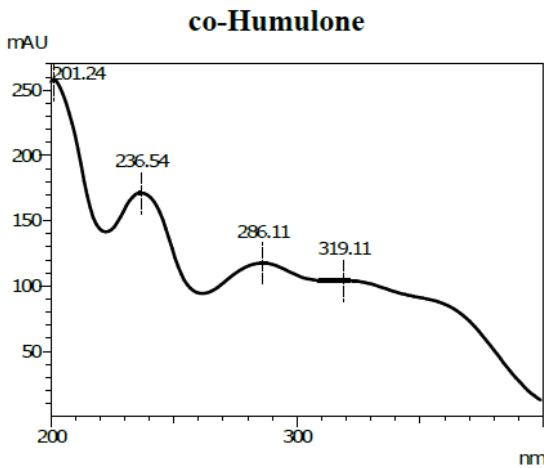
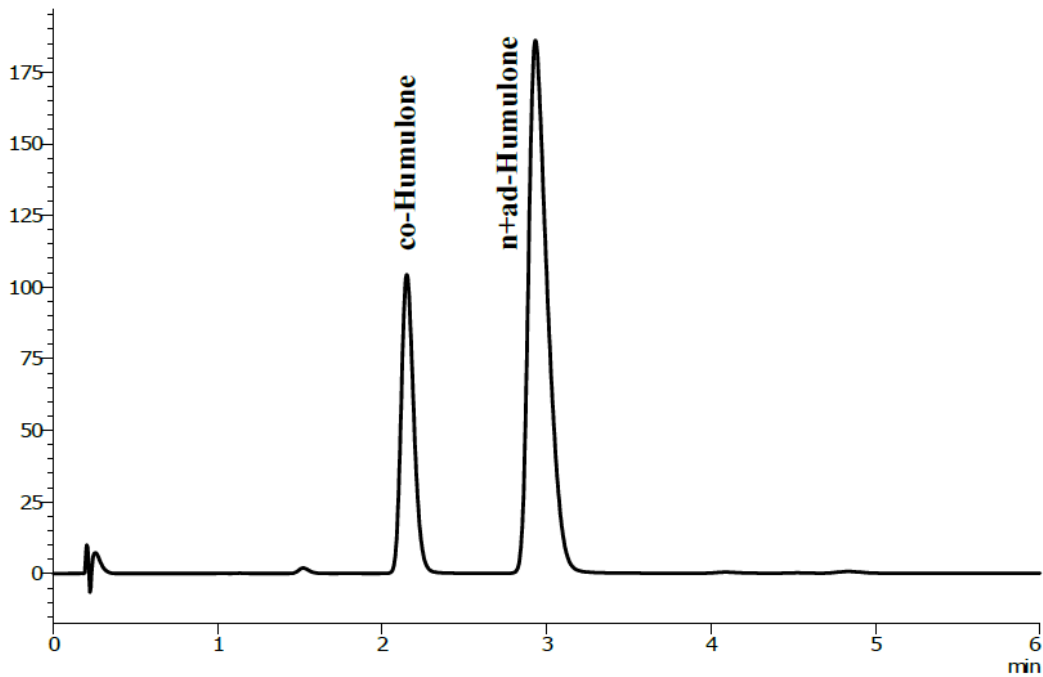
International Hop Standards Committee

Data acquired by: Jeremy Leker, 10/24/19

Column: Restek Raptor ARC-18 1.8um 50 x 3mm, 0.6mL/min, 40C

Mobile Phase: 725mL MeOH / 265mL H₂O / 20 mL 85% H₃PO₄ / 0.75mL 0.1 M NaEDTA

mAU



International Calibration Standards

for HPLC Analysis of Humulones

page 3 of 3

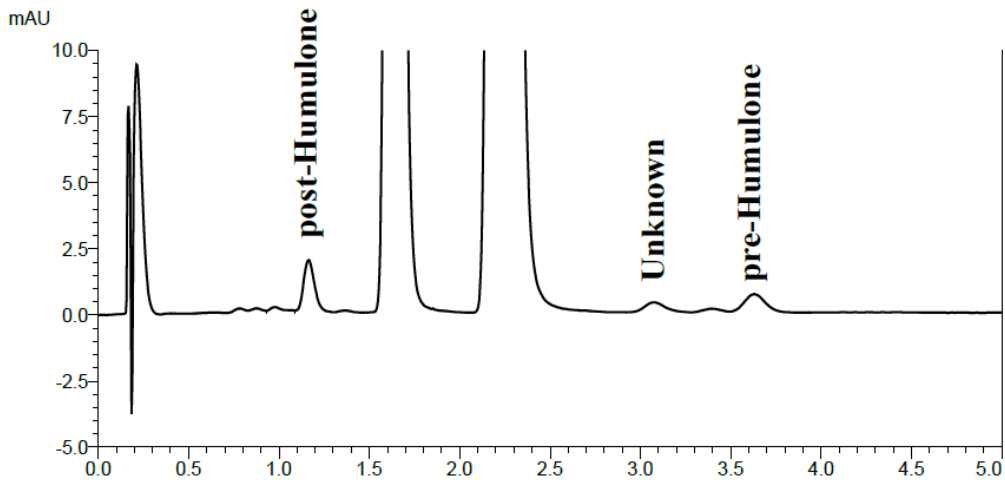
DCHA:α-Acids ICS-A1

International Hop Standards Committee

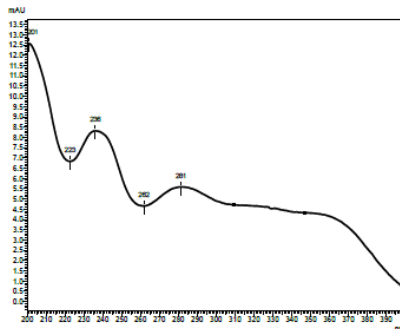
Data acquired by: Jeremy Leker, 10/24/19

Column: Restek Raptor ARC-18 1.8um 50 x 3mm, 0.6mL/min, 40C

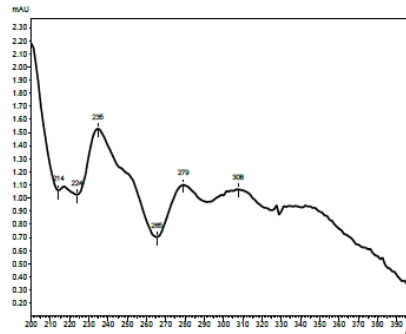
Mobile Phase: 725mL MeOH / 265mL H₂O / 20 mL 85% H₃PO₄ / 0.75mL 0.1 M NaEDTA



post-Humulone



Unknown



pre-Humulone

