

M. Biendl (Co-Chairman EBC) and
B. Foster (Co-Chairman ASBC)

New International Calibration Standard (ICE-4) for HPLC Analysis of α - and β -acids

Submitted on behalf of the International Hop Standards Committee

The International Hop Standards Committee (IHSC), announces the release of a new calibration standard, ICE-4, for the HPLC analysis of α - and β -acids in hops and in hop products. This standard replaces ICE-3, which is now withdrawn.

Descriptors: new calibration standard, HPLC analysis, hop products, Iso- α -acids, EBC Method

Background

In 2001, the ASBC, EBC, IoB (now IBD), and BCOJ approved the release of a set of HPLC standards for use in the quantitative determination of isomerized and reduced-isomerized α -acids in hop products and in beer:

- DCHA-Iso, ICS-I (Iso- α -acids standard);
- DCHA-Rho, ICS-R (Rho-iso- α -acids standard);
- Tetra, ICS-T (Tetrahydroiso- α -acids standard);
- DCHA-Hexa, ICS-H (Hexahydroiso- α -acids standard).

For the production, release and maintenance of this set of standards the International Subcommittee for Isomerized Hop α -Acids Standards was founded working very successfully since that time. It is consisting of experts representing ASBC, EBC, IBD and BCOJ.

In June 2009, the ASBC and EBC asked this international subcommittee to also take on the responsibility for other standards used for HPLC analysis of hops including the standard for α - and β -acids. Therefore, the name was changed from International Subcommittee for Isomerized Hop α -Acids Standards to International Hop Standards Committee (EBC/ASBC/BCOJ/IBD). Currently this committee is jointly chaired by Bob Foster (Molson Coors, USA) and Martin Biendl (Hopsteiner, Germany) both acting as co-chairman representing the Americas and the rest of the world respectively.

Release of ICE-3

Stocks of ICE-3 are almost exhausted. In anticipation of this, in 2016 the Working Group of Hop Analysis (AHA) initiated the preparation of a replacement standard. Similar efforts were undertaken as in case of the selection of ICE-3. In the end, again a supercritical CO₂-extract was selected as the most suitable replacement material. The new standard was supplied by Hopfenveredlung St. Johann (Wolnzach, Germany), under the guidance of AHA member Roland Schmidt. Packaging was also carried out in the same company. The committee records its considerable appreciation to Roland Schmidt and his colleagues for all their skilled input to the successful manufacture of this new standard.

Following preparation, in June 2018 members of the International Hop Standards Committee (IHSC) carried out a collaborative trial in order to validate the new standard and assign values to the concentration of the α - and β -acids. This work included a collaborative HPLC study in which the prospective new standard was crosschecked against the existing standard and against high purity DCHA- α -acids and DCHA- β -acids standards (both kindly supplied by IHSC member Bob Smith, Hopsteiner USA).

This new standard, ICE-4, becomes the recommended standard and should be used for commercial transactions as well as for quality control purposes.

Use of the New Standard

As would be expected, the composition of ICE-4 is not identical to the standard it replaces, but it can be used in exactly the same way. No significant differences were observed when quantifying α - and β -acids using ICE-4 vs. ICE-3. Such differences can be expected to be within the normal range of experimental error.

The following composition of ICE-4 has been determined and agreed on by the International Hop Standards Committee (IHSC):

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|----------------------------------|---------------------------------|
| ■ Total α -acids: 42.58 % | ■ Total β -acids: 26.54 % |
| ■ Cohumulone: 10.98 % | ■ Colupulone: 13.02 % |
| ■ N+adhumulone: 31.60 % | ■ N+adlupulone: 13.52 % |

How to Purchase

Stocks of ICE-4 are being divided between ASBC (in USA) and EBC (distribution through Labor Veritas in Switzerland), from which sources analysts can purchase the new standard.*

ICE-3 will now be available only while stocks last. ICE-4 is valid from August 1st, 2018.

* Purchasers in the USA, Canada, Central and South America should contact ASBC headquarters (email: asbc@scisoc.org; tel: +1 (651) 454-7250), while those in Europe and Africa should direct enquiries to Labor Veritas, Zürich, Switzerland (email: admin@laborveritas.ch; tel: +41 (0) 44 283 29 30). Persons ordering from other parts of the world may make their approach to either party.

July 6th, 2018

