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# New International Calibration Standards (ICS-Hum1, ICS-X1) for HPLC Analysis of Humulinones and Xanthohumol

Submitted on behalf of the International Hop Standards Committee

The International Hop Standards Committee (IHSC) announces the release of two new calibration standards, ICS-Hum1 and ICS-X1, for the HPLC analysis of humulinones and xanthohumol.

## Background

20 years ago, the International Hop Standards Committee (IHSC) was founded to take care of the production, release and maintenance of HPLC calibration standards for use in the quantitative determination of various bitter components in hops, hop products and in beer. Since that time, the scope includes the International Calibration Standards (ICS)

- ICS-I (Dicyclohexylamine salts of iso- $\alpha$ -acids, DCHA-Iso),
- ICS-R (Dicyclohexylamine salts of rho-iso- $\alpha$ -acids, DCHA-Rho),
- ICS-T (Purified tetrahydroiso- $\alpha$ -acids, Tetra),
- ICS-H (Dicyclohexylamine salts of hexahydroiso- $\alpha$ -acids, DCHA-Hexa),

as well as the International Calibration Extract

- ICE (hop extract with given contents of  $\alpha$ -acids and  $\beta$ -acids).

To progress its mission, the International Hop Standards Committee worked hard to produce two new HPLC calibration standards that are now prepared and approved. These new International Calibration Standards are:

- ICS-Hum (Dicyclohexylamine salts of humulinones, DCHA-Humulinones),
- ICS-X (Purified xanthohumol).

Each standard was evaluated for purity by HPLC and the stabilities of the preparations were checked. Both standards are considered stable in cold (frozen) storage for several years.

## Release of ICS-Hum

In 2016 the subcommittee initiated the preparation of this standard based on a paper of Maye et al. (J. Am. Soc. Brew. Chem. 74: 57-60, 2016). The new standard was prepared in the laboratories of S. S. Steiner, Inc., under the guidance of committee member, John Paul Maye. Packaging was also carried out in the same laboratory. The committee records its considerable appreciation to Bob Smith and Jeremy Leker for all their skilled input to the successful manufacture and purification of this new standard. Following preparation, committee members conducted extensive analysis in order

to validate the new standard and assign a value to the content of humulinones. This validation included a collaborative HPLC study in which the prospective new standard was crosschecked against a high purity, DCHA-humulinones standard (also produced in the laboratories of S. S. Steiner, Inc.).

## Release of ICS-X

In 2017 the subcommittee initiated the preparation of this standard based on a paper of Biendl (Hopfenrundschau International 2003/2004: 60-64). The new standard was prepared in the laboratories of Hopsteiner (Germany) under the guidance of committee member, Martin Biendl. Packaging was also carried out in the same laboratory. The committee records its considerable appreciation to Timo Lambertsen for all his skilled input to the successful manufacture of this new standard. Following preparation, committee members conducted extensive analysis in order to validate the new standard and assign a purity value to the content of xanthohumol. This validation included a collaborative HPLC study in which the prospective new standard was crosschecked against a high purity, xanthohumol standard (kindly supplied by Jeremy Leker, S. S. Steiner, Inc.).

**Note: These new standards, ICS-Hum1 and ICS-X1, now become the recommended standards and should be used for quality control purposes. These standards are for HPLC use and should never be used for sensory research or ingested.**

## How to Purchase

Stocks of ICS-Hum1 and ICS-X1 are being divided between SciSoc (ASBC) in the USA and Labor Veritas (EBC) in Switzerland. Analysts can purchase the new standards in 250mg vials. \*Orders are dispatched by express mail to minimize risk of damage in transit.

Detailed information pertaining to each standard, including full instructions for use, is available from SciSoc (ASBC) or Labor Veritas (EBC) on request and is automatically supplied with each purchase.

\*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 purchase from either party).

