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Brennereitechnologie

Summary information of the CYANUREX®-procedure

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Technical informations and instructions for use

Ethyl carbamate in fruit brandies:

The compound ethylcarbamate (EC), also called urethane, is known as an undesirable, health-threatening and legally limited food substance, especially in stone fruit brandies.

According to recent studies in the USA on the effects of EC, the Federal Institute for Health Protection of Consumers and Veterinary Medicine (BgVV) demands to minimize the ethylcarbamate content of alcoholic beverages.

In the European Union Spirits with EC contents of more than 1 mg / l are not marketable!

Causes of ethylcarbamate development:

EC is formed from hydrogen cyanide under the action of light. Cyanide enters the mash during fermentation and storage of stone fruit mash from the stones. During distillation, hydrocyanic acid is driven over into the distillate. The hydrocyanic acid content of a stone fruit distillate and the resulting amount of EC depends on many factors (fermentation, mash storage, distillation plant, etc.).

The targeted limitation of hydrocyanic acid in the distillate is the most important prerequisite for adhering to the EC limit value there:

As soon as hydrocyanic-acid containing distillates are exposed to light, hydrogen cyanide is converted to EC. Only by a largely complete removal of hydrogen cyanide, the subsequent EC formation can be prevented.

Mechanism of the CYANUREX®-procedure:

By adding the special copper salt CYANUREX® to the mash or the raw distillate before the distillation, the usually too low copper activity of the still is enhanced. CYANUREX® binds the hydrocyanic acid released in the distillation in the form of sparingly soluble, non-volatile cyanides, which do not pass into the distillate but remain in the distillers' wash.

By preventing the passage of hydrocyanic acid into the distillate, the formation of EC in the finished product is excluded even when stored under exposure to light.

The procedure has been tried and tested in practice for decades and permitted under food and customs law as well as described in detail in the specialist literature (Kleinbrennerei 11-12 / 88, 12/06).

Distillates of mashes that have been distilled with CYANUREX® are free from hydrogen cyanide and therefore have a more typical fruit smell and taste. The bitter almond flavour frequently criticized in stone fruit distillates, caused by increased levels of hydrocyanic acid, is excluded. Furthermore, other undesirable flavoring agents (e.g., sulfur containing compounds) are also eliminated.

Implementation of the CYANUREX®-procedure:

1. **One-time distillation with column:**

- determine CYANUREX® requirements by test distillation (Probedestillation) and hydrocyanic acid determination (Schliessmann CYANID-test) (see corresponding instructions);
- if test distillation is not possible, choose a with CYANUREX® addition of 20 g/hl, at high stone content with 30 g/hl;
- fill the still with mash;
- remove the required amount of CYANUREX® from the pack with a spoon and weigh in a beaker;
- add CYANUREX® onto the mash, stir briefly or dilute with a little water;
- distill under separation of heads, heart and tails fraction;
- check hydrocyanic acid content of the middle fraction with CyanoQuant test or Schliessmann CYANID test sticks. Possibly increase CYANUREX® additive during the next distillation, if necessary reduce it by 5 g/hl in the absence of hydrocyanic acid distillation.

2. **Low wines- / fine brandy-procedure (=first/second distillation):**

- distil mashes without CYANUREX® additive;
- examine collected raw distillates with Schliessmann CYANID-test sticks for cyanide content;
- calculate required CYANUREX® dose according to detailed procedure manual;
- add CYANUREX® to the raw distillates in the still before the fine brandy production;
- produce fine brandy under separation of the first, middle and last fraction;
- switch to last fraction at the latest at 50% vol.

3. **Determining the CYANUREX®-requirement by sample distillation:**

- dilute 200 ml of mash with 200 ml of water using and slowly distill off 80 ml.
- determine the hydrocyanic acid content of the sample distillate with the Schliessmann CYANID test;
- determine CYANUREX®- requirement according to the table in the detailed instructions for use according to the determined hydrocyanic acid content.

4. **Check for completeness of cyanide separation:**

- check hydrocyanic acid levels with the CyanoQuant test or Schliessmann CYANID test for each middle fraction distillate;

- separate distillates with hydrocyanic acid contents of more than 1 mg / l (calculated on drinking strength) and then distill them again; with addition of CYANUREX®
- last fractions and distillates with “unknown history and origin” should be redistilled since the EC-content may be increased.

Safety instructions:

CYANUREX® is a distillery adjuvant that may only be added to the fuel before the distillation of mashes and low wines.

CYANUREX® is to be stored tightly closed, dark and dry.

CYANUREX® must not get into the hands of children!

Contact with the skin or mucous membranes should be avoided, do not breathe dust!

In case of skin contact rinse thoroughly with water!

CYANUREX® is harmful if swallowed! In case of indisposition consult a doctor!

Indications for the disposal of distillery residues:

Distiller's washes may generally not be discharged into public sewers, but must be collected in separate containers and neutralized. To a limited extent, the application on agricultural land is possible.

By using CYANUREX® the copper content in low wines and sewages is increased. However, the copper is present in insoluble, inactive form. Such sewages should not be spread on soils with increased copper contents (e.g., vineyards).

The responsible agricultural offices provide information on the copper content of the areas in question.

For big distiller plants, a special process for the separation of copper is available. Upon request, you will receive further information.

All information in this publication corresponds to our current experience and knowledge.

Schliessmann Kellerei-Chemie neither warrants that the products can be used without prior diligent testing as described above, nor that patent rights of third parties are not infringed by their use.