COEI-1-MEMBIP Bipolar electrodialysis membranes

1. Object, origin and scope of application

A bipolar membrane is a thin, dense, insoluble wall composed of a polymer material functionalized by ionic groups. A bipolar membrane has an anionic face and a cationic face; it is equivalent to combining a cationic membrane and an anionic membrane into a single membrane. Cationic and anionic membranes are defined in the International Oenological Codex (Electrodialysis membranes, OENO 29/2000)

The membrane pair used in the bipolar electrodialysis acidification technique consists of a bipolar membrane and a cationic membrane. This arrangement, in the stack of an electrodialyser, only permits the extraction of cations.

The cationic membrane allows the preferred flow of cations, in particular potassium.

The function of the bipolar membrane is to maintain the acido-basic ionic balance of the system, following the extraction of a percentage of the potassium from the must or wine.

2. Composition of the membranes

2.1. Composition of the cation membrane

Cation membranes used in the acidification technique by bipolar membrane electrodialysis must comply with the prescriptions stated in the monograph concerning electrodialysis membranes (Resolution OENO 29/2000) in the International Oenological Codex.

2.2. Composition of the bipolar membrane

The bipolar membrane suitable for use is a styrene-divinylbenzene copolymer, whose cationic face and anionic face comply with the composition of cationic and anionic membranes described in the International Oenological Codex (Electrodialysis membranes, OENO 29/2000)

2.3. They should be manufactured in accordance with the good manufacturing practices for the substances listed in:

2.3.1. Annex 1 of the monograph on electrodialysis membranes (Resolution OENO 29/2000) pertaining to materials placed in contact with foodstuffs.

2.3.2. Annexes 2 and 3 of the monograph on electrodialysis membranes (Resolution OENO 29/2000) pertaining to ion-exchange resins used in processing foodstuffs.

2.4. They should be prepared to serve their intended function, in accordance with the instructions provided by the manufacturer or supplier.

2.5. They should not release any substance in a quantity which endangers human

health or which degrades the taste or odour of foodstuffs.

2.6. In use, there should be no interaction between the constituents of the membrane and those of the must or wine likely to form new compounds in the treated product that could have toxicological consequences.

3. Limits on use

The diffusion of small molecules such as ethanol should be limited and should not result in a reduction in the alcoholic strength greater than 0.1% by volume.

4. Conditions of use

The membranes shall be stored and cleaned using accepted techniques and substances whose use is authorised for the preparation of foodstuffs.