BCOP LLBO for Identifying i) Chemicals Inducing Serious Eye Damage and ii) Chemicals Not Requiring Classification for Eye Irritation or Serious Eye Damage

Created on: 17-12-2019 - Last modified on: 06-01-2020

SCOPE OF THE METHOD

Alternative method relates to	Human health
Alternative method is situated in	Regulatory use - Routine production
Type of alternative method	In vitro - Ex vivo
This method makes use of	Animal derived cells / tissues / organs
Species from which cells/tissues/organs are derived	Bovine

DESCRIPTION

Method keywords

eye irritation
opacitometer
OECD TG 437-update 2020
Category 1
No Category
opacity

Scientific area keywords

regulatory toxicology
regulatory use
eye irritation

Method description

In order to find a solution for the center-weighted opacity reading associated with the OP-KIT opacitometer, a prototype of a laser light-based opacitometer (PLLBO) allowing better measurement of opacities was developed (Van Goethem et al., 2010; Annex 1). The technical optimization and optical characteristics of this device can be found in the paper by Verstraelen et al. (Verstraelen et al., 2013; Annex 2). The LLBO uses a monochromatic laser light source and has the advantage of analysing the complete corneal surface, and is therefore able to detect more efficiently opaque spots located around the periphery of the excised corneas. The different devices result in a different read-out and different threshold values that distinguish between the different irritation categories (Verstraelen et al., 2013, 2018).

Lab equipment

Opacitometer

Method status

Currently submitted for further validation by an external party (e.g. OECD, EURL ECVAM,...)

PROS, CONS & FUTURE POTENTIAL

Advantages

Laser (monochromatic) light ;
One light source (one beam) ;
The whole cornea is analysed ;
Linear ;
The width of the light beam can be adjusted.

Modifications

Non planned.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Van Goethem, F., Hansen, E., Sysmans, M., De Smedt, A., Vanparys, P., Van Gompel, J. (2010). Development of a new opacitometer for the bovine corneal opacity and permeability (BCOP) assay. Toxicol. *In Vitro* 24:1854-1861
Verstraelen, S., Jacobs, A., De Wever, B., Vanparys, P. (2013). Improvement of the Bovine Corneal Opacity and Permeability (BCOP) assay as an *in vitro* alternative to the Draize rabbit eye irritation test. Toxicol. *In Vitro* 27: 1298–1311
Verstraelen, S., Maglennon, G., Hollanders, K., Boonen, F., Adriaens, E., Alépée, N., Drzewiecka, A., Gruszka, K., Kandarova, H., Willoughby, J.A., Guest, R., Schofield, J., Van Rompay, A.R., 2018a. Reprint of "CON4EI: Bovine Corneal Opacity and Permeability (BCOP) test for hazard identification and labelling of eye irritating chemicals." Toxicol. Vitr. 49, 53–64. https://doi.org/10.1016/j.tiv.2018.03.005
Adriaens, E., Van Rompay, A.R., et al., Verstraelen, S. (2019). Overall performance and multi-laboratory validation of Bovine Corneal Opacity and Permeability (BCOP) Laser Light-Based Opacitometer (LLBO) test method with regard to solid and liquid chemicals testing, Manuscript under preparation

Associated documents

PARTNERS AND COLLABORATIONS

Organisation

Name of the organisation VITO
Department Health

Country Belgium

Geographical Area Flemish Region

Coordinated by

Financed by