

[P1.3.42]

**High-Throughput LC-MS/MS method to evaluate the presence of exogenous glycerol in wines**

L. Tonidandel, S. Moser, R. Larcher\*, D. Trainotti, D. Slaghenaufi  
*Fondazione Edmund Mach, Italy*

Glycerol is a natural constituent of wine being produced by yeast during fermentation and its concentration ranges between 5 and 11 g/L depending on yeast strain. It plays an important role on the sweet taste of wine [1]. The addition of synthetic glycerol to wines in order to increase this parameter is not allowed by the European oenological legislation [2]. Actually, the strategy to investigate the presence of exogenous glycerol in wine is based on the detection of impurities produced by the industrial processes on its production [3], which are absent in wines. Synthetic glycerol contains the follows impurities: 3-methoxypropane-1,2-diol (3-MPD) and cyclic diglycerols (CycDs) formed during the purification of the rough industrial product conducted through a distillation process. Gas chromatography mass spectrometry (GC-MS) is the analytical method adopted by the OIV to detect the fraudulent addition of glycerol by measure these two contaminants [4]. To the best of our knowledge, this is the only validated method to detect and quantify 3-MPD and CycDs in wine. However, the application of the GC-MS method shows serious difficulties: sample preparation and time analysis (runtime about 42 min); dirty injections with frequent damage for the column (particularly in the case of sweet wines); mass spectrometer ion source must be cleaned very often to improve the required sensitivity. In order to overcome these limitations a simple LC-MS/MS method has been developed.

**References**

1. Noble A.C., Bursick G.F. The contribution of glycerol to perceived viscosity and sweetness in white wine. *Am. J. Enol. Vitic.* 1984, 35, 110–112.
2. Commission Regulation (EC) No 606/2009 of 10 July 2009 laying down certain detailed rules for implementing Council Regulation (EC) No 479/2008 as regards the categories of grapevine products, oenological practices and the applicable restrictions.
3. Fauhl C., Wittkowski R., Lofthouse J., Hird S., Brereton P., Versini G., Lees M., Guillou C. Gas chromatographic/mass spectrometric determination of 3-methoxy-1,2-propanediol and cyclic diglycerols, by-products of technical glycerol, in wine: interlaboratory study. *J AOAC Int.* 2004, 87, 1179-1188.
4. OIV-MA-AS315-15. Determination of 3-methoxypropane-1,2-diol and cyclic diglycerols (by-products of technical glycerol) in wine by GC-MS - description of the method and collaborative study - (Resolution Oeno 11/2007)

Keywords: cyclic diglycerols, 3-methoxypropane-1,2-diol, Wine, LC-MS/MS