

## CHARACTERIZATION OF PRODUCTS FORMED DURING HYDROTHERMAL TREATMENT OF WINERY-WASTE BIOMATERIAL

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### Abstract

Wine production remains one of the most important agricultural activities in the world, however, leads to the production of large quantities of winery-waste biomaterial. It has been estimated that around 25 kg of residues derive (around 70% grape skins, 12% stalks and 18% seeds) from 100 kg of grapes [1]. It is known that the waste biomaterial from the winery contains large amounts of various functional components with different bioactive properties (antioxidants, polyphenols, biosurfactants, anthocyanins, dietary fiber, etc.). Therefore, the wine industry encourages alternatives for recycling their waste biomaterials in order to profit from waste through their use as raw value-added materials. One of the technologies that achieve the reuse of bio-waste is the hydrothermal process especially suitable for the treatment of wet waste. Hydrothermal treatment of bio-waste takes place at high temperature and pressure operation conditions (200-400°C and 4-25 MPa) under sub/super-critical water system. A solid phase enriched in carbon (hydrochar, HC), a liquid phase with dissolved organic compounds and a small quantity of gases are separated as primary products of reaction [2,3]. In this paper, the characterization of HC and liquid phases formed during hydrothermal treatment of winery-waste biomass is performed. The HC was synthesized in a commercial stainless steel reactor by hydrothermal carbonization of black grape bio-waste at 200°C under auto-generated pressure of about 1.2 MPa for 2 h. The yield of HC was 44%. The general characteristics of the synthesized HC were determined. In the liquid phase, the total polyphenol content and antioxidant activity were determined. The results of the gravimetric analysis showed that HC has almost equal presence of moisture and dry matter (41% and 59%, respectively). The largest part of dry matter is volatile organic matter (56%), while the ash content is 3%. The liquid phase (2 mg/ml of dry extract in methanol) has high polyphenols content (0.66 g gallic acid/L) and showed a high antiradical potential (75% against DPPH free radical).

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### References

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