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Data Article

# Data on changes in red wine phenolic compounds, headspace aroma compounds and sensory profile after treatment of red wines with activated carbons with different physicochemical characteristics

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ABSTRACT

Data in this article presents the changes on phenolic compounds, headspace aroma composition and sensory profile of a red wine spiked with 4-ethylphenol and 4-ethylguaiacol and treated with seven activated carbons with different physicochemical characteristics, namely surface area, micropore volume and mesopore volume ("Reduction of 4-ethylphenol and 4-ethylguaiacol in red wine by activated carbons with different physicochemical characteristics: impact on wine quality" Filipe-Ribeiro et al. (2017) [1]). Data on the physicochemical characteristics of the activated carbons are shown. Statistical data on the sensory expert panel consistency by General Procrustes Analysis is shown. Statistical data is also shown, which correlates the changes in chemical composition of red wines with the physicochemical characteristics of activated carbons used.



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**Specifications Table**

| | |
|---|---|
| Subject area | *Chemistry* |
| More specific subject area | *Food and Wine Chemistry* |
| Type of data | *Table, graph, figure* |
| How data was acquired | *Quantachrome (Nova 4200e)*<br>*FTIR (Unicam Research Series)*<br>*HPLC (Ultimate 3000, Dionex) with a Photodiode array detector (PDA-100, Dionex)*<br>*GC–MS (Thermo-Finningam) with CombiPAL automated HS-SPME (CTCANALYTICS, AG)* |
| Data format | *Analysed* |
| Experimental factors | *Wine sample was spiked with two levels of 4-ethylphenol (1500 μg/L and 750 μg/L) and 4-ethylguaicol (300 μg/L and 150 μg/L) and treated with seven activated carbons with different physicochemical characteristics.* |
| Experimental features | *Activated carbons adsorption isotherms were analysed by gas adsorption and mercury porosimetry, surface groups were analysed by FTIR.*<br>*Wine phenolic acids and anthocyanins were analysed by RP-HPLC with a photodiode array detector and headspace aroma compounds were analysed by headspace solid phase microextraction using a 50/30 μm DVB/Carboxen/PDMS fibre followed by GC–MS using an Optima FFAP column (30 m × 0.32 mm, 0.25 μm). Sensory analysis was performed by an expert panel of six experts.* |
| Data source location | *Vila Real, Portugal* |
| Data accessibility | *Data with this article* |

**Value of the data**

- Data from this research highlights the effect of the physicochemical characteristics of activated carbons on the phenolic, headspace aroma and sensory profile of wines spiked with 4-ethylphenol and 4-ethylguaiacol.
- We analysed the phenolic profile by RP-HPLC and the aroma compounds by HS-SPME-GC/MS in red wines treated with activated carbons presenting different physicochemical characteristics and the results were analysed by principal component analysis for highlighting relations between chemical composition of red wines and physicochemical characteristics of activated carbons.
- Activated carbons removal efficiency of red wine ethylphenols was related to their surface area and micropore volume.
- High surface area of mesopores and total pore volume were important for the anthocyanin removal and decrease in colour intensity.
- This data could serve as a benchmark for other researchers, evidencing the influence of activated carbons treatment on the individual phenolic, chromatic and aroma compounds and sensory profile of red wine.

## 1. Data

The data reported includes information about the adsorption isotherms of activated carbons (ACs) (Fig. 1), metal composition of activated carbons (Table 1) and surface group chemistry of activated carbons (Fig. 2 and Table 2). Also the sensory profile of wines (Fig. 3a) and consistency of the sensory panel scores were analysed by General Procrustes Analysis (GPA) (Fig. 3b and Table 3) and the scaling factor of each expert were determined (Table 4). The headspace aroma profile of red wines before and