Effect of Bentonite Characteristics on the Elemental Composition of Wine

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Physical, chemical, and mineralogical characteristics of six bentonites were assessed and related to their elemental release to wine. Extraction essays of bentonites in wine at three pH levels were carried out. The multielemental analysis of bentonites and wines was performed by atomic absorption spectrometry (AAS) and inductively coupled plasma mass spectrometry (ICP-MS). Bentonite addition resulted in significantly higher concentrations of Li, Be, Na, Mg, Al, Ca, Sc, V, Mn, Fe, Co, Ni, Ga, Ge, As, Sr, Y, Zr, Nb, Mo, Cd, Sn, Sb, Ba, W, Ti, Bi, and W. In contrast, the concentrations of Si, K, Cu, Zn, and Rb significantly decreased. A strong correlation between Na concentrations of treated wines and its content in bentonite exchange complex was observed. Al and Fe contents reflected bentonite extractable aluminous and ferruginous constituents, while Be, Mg, Ca, V, Mn, Ni, Ge, Zr, Nb, Mo, Sn, Sb, Ti, Pb, and U concentrations reflected the elemental composition of bentonites. Several nonconformities with OIV specifications demonstrated the need for an effective control.

KEYWORDS: Contaminant elements; wine; bentonite physical and chemical characteristics; ICP-MS