Oxygen isotope constraints on the nature of fluids of the vein-type fluorite deposits of Cerro Aspero batholith, Southern Cordoba Province, Argentina.

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Vein-type fluorite deposits of economic importance in the Southern Córdoba Province, Argentina, occur mainly hosted in porphyritic biotite granites of the Devonian Cerro Aspero batholith.

The veins, of Cretaceous age, occupy steeply dipping fault zones and are mainly composed of fluorite and chalcedony. They show open space-filling textures and are closely related with pervasive silicic, argillic and subordinately sericitic alteration. Three successive stages of mineralization were distinguished by vein chronology, REE data and fluid inclusions in the fluorite ore. These latter revealed that the stages I, II and III formed from very low salinity fluids at temperatures of 160°C, 136°C and 116°C, respectively. $\delta^{18}O$ values (SMOW) obtained for muscovite, clay minerals and vuggy quartz, closely related to the fluorite ore, range from 15.0 ‰ to 9.1‰. The $\delta^{18}O$ in these samples becomes systematically lighter from the stage I to III. The $\delta^{18}O$ values of the hydrothermal fluids from the stages I to III, calculated at the above temperatures, vary from 5.8‰ to -9.5‰. These values probably represent highly exchanged meteoric water in a regime of progressive increase in the water/rock ratio as result of the recurring circulation of fluids during the evolution of the hydrothermal system.