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Carbonate Phase Precipitation Within Missouri Springs

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Carbonate Phase Precipitation Within Missouri Springs

Colloidal white precipitates are observed in Missouri springs, as well as other regions. Chemical parameters of the spring water were measured in situ and colloidal precipitates were collected in order to determine their formation mechanism. Spring water pH and temperature both increase slightly downstream from the spring to the furthest downstream location approximately 1200 nautical meters from the conduit. Eh values decreased slightly while conductivity remained relatively consistent throughout the sampling reach. The pH increase occurs as a result of a decrease in pressure and a corresponding CO₂ loss from the spring system as it rises from a known depth of at least 200 feet. This pH increase lowers the solubility of Ca⁺² and/or Mg⁺² in solution with respect to carbonate phase(s). Colloidal spring precipitates were isolated and examined using a Scanning Electron Microscope and wet-chemical analysis following digestion. The particles were determined to be composed of low-Mg calcite (CaCO₃).

Kyle Rybacki is a senior at the Missouri University of Science & Technology studying geology. He is the son of Steven and Charlene Rybacki of Nashville, Illinois. Currently, he is the president of the MSM Spelunkers and vice president of geological sciences honor society, as well as member of other organizations on the Missouri S&T campus. Outside of school, Kyle is a member of the National Speleological Society, Cave Research Foundation, and Missouri Speleological Survey. Recently, Kyle has been accepted into the New Mexico Institute of Mining and Technology where he plans to pursue a M.S. in geochemistry before attempting a Ph.D. in carbonate geochemistry.