Petrified wood is normally preserved with SiO$_2$—rarely does it involve other minerals. To better understand the unusual circumstances that involve other minerals, we have been studying some examples of petrified wood that involve the elements copper and uranium respectively in their preservation. Critically, we would like to see if those elements replicate the original structure of the wood (and thus suggest involvement in the original permineralization of the wood), or if they appeared at a later stage.

The samples were made into thin sections for petrographic analysis. Additionally, the samples were examined on a scanning electron microscope (SEM) with an energy dispersive x-ray spectroscopy (EDS) attachment to map elemental compositions of the thin sections.

In the uranium-rich sample, uranium and sulfur were restricted to cracks in the sample — the rest of the sample was much more like normal petrified wood with a SiO$_2$ rich composition. The distribution of these elements within the cracks suggest that the mineral infilling was emplaced after the wood was petrified — possibly during a later hydrothermal alteration event.

The copper-rich sample was much more uniform and it showed a composition dominated by sulfur and copper. As the copper is involved in the preservation of the structure of the wood, it suggests that it was involved in the original permineralization of the wood before any significant decay had taken place.