

## CESIUM DEPOSITS

Trueman, D.L., Ph.D, P.Geo, Downing, B.W., M.Sc, P.Geo, Richards, T., Ph.D, P.Geo

### ABSTRACT

Cesium (Cs) is a little known element, the bulk of which is used in the oil well servicing in form of cesium formate, but also has myriad uses in high tech specialty applications.

Primarily, cesium has been won from the minerals pollucite and lepidolite from “giant” pegmatites like Tanco in Manitoba, Bikita in Zimbabwe, or the Yichun granite, PRC. These sources are now problematic; production at Tanco having been stopped by fall of loose rock, Bikita by exhaustion of stockpiles. Several small cesium deposits have been identified in Australia, Namibia, the U.S. and Canada but none have reached systematic production.

A second type of cesium is found in form of epithermal geyserites which have been identified in Tibet, India and Argentina, and although of lower Cs grades and widely varying mineral assemblages. may be equal in their contained cesium to the large pegmatite sources and in turn their diverse mineralogy lends to more easily processible, and less costly metallurgy.

A third type of cesium deposit is forming under the Yellowstone National Park in the U.S. where Li-Cs greisenizing is happening and mineral assemblages are forming at very low temperatures and pressures under active geysers, and not unlike cesian geyserites.

The source of Cs bearing pegmatites is probably that of fractionation of S-type granites and the source of Cs bearing geyserites is probably similar to that at Yellowstone in which large volumes of rhyolites over the Yellowstone mantle plume are being leached by epithermal fluids.

Cesium is now on the U.S. Government’s critical elements list and there is burgeoning exploration for Cs-bearing pegmatites. At present Albemarle Corp. in the PRC and the PRC’s Sinomine Resource Group control the cesium industry.

This study was undertaken to characterize the importance, geology, geochemistry, mineralogy, and geometallurgy of these types of cesium deposits and offer some insight as to the origins of the novel deposits.