

Silver biocide offers a potential advantage over iodine, the current state of the art in US spacecraft disinfection technology, in that silver can be safely consumed by the crew. Low concentrations of silver (<500 ppb) have been shown to kill bacteria in water systems and keep it safe for potability. Silver does not require hardware to remove it from a water system, and therefore can provide a simpler means for disinfecting water. The Russian segment of the International Space Station has utilized an electrochemically generated silver solution, which is colloidal in nature. To be able to reliably provide a silver biocide to drinking water by electrochemical means would reduce mass required for removing another biocide such as iodine from the water. This would also aid in crew time required to replace iodine removal cartridges.

Future long term missions would benefit from electrochemically produced silver as the biocide could be produced on demand and requires only a small concentration to be effective. Since it can also be consumed safely, there is less mass in removal hardware and little consumables required for production.

The goal of this project initially is to understand the nature of the electrochemically produced silver, the particle sizes produced by the electrochemical cell and the effect that voltage adjustment has on the particle size. In literature, it has been documented that dissolved oxygen and pH have an effect on the ionization of the electrochemical silver so those parameters would be measured and possibly adjusted to understand their effect on the silver.