

Silver in Glass vs. Plastic Containers

by David A. Revelli, MS

INTRODUCTION

A great deal of controversy has arisen in the market place on the question of whether it is better to store silver solutions in glass versus plastic containers. There is a misconception that has prevailed in the market place that glass is better. The idea that glass containers are better for storing products which contain silver has never been proven scientifically. In fact, it has been reported in other studies that glass may have a detrimental effect on silver products.

TEST WORK

I have been conducting biological studies for 3 years, in the laboratory of a major private institution, on the use of silver products to kill and inhibit the growth of bacteria. I have conducted thousands of tests on numerous strains of pathogenic bacteria. In the testing I have completed, I have used both glass (5 ml glass test tubes) and plastic (Falcon 5 ml polypropylene plastic test tubes). In some of the test work we found that there was a difference in the amount of silver that was needed to kill the bacteria when glass was used versus plastic test tubes. In order to make sure this was the case, it was decided that the MIC tests (Minimum Inhibitory Concentration) should be replicated by more than one person and a direct comparison was made. The MIC tests were performed in triplicate in both 5 ml 13X100mm glass test tubes and 5 ml Falcon polypropylene plastic test tubes. Results of the bacterial (MIC) tests showed that *Staphylococcus aureus* was inhibited at 2.5 ppm when the MIC test was performed in the plastic test tubes. *S. aureus* was inhibited at 5 ppm when the MIC test was performed in glass test tubes. This suggested that the material with which the test tubes were made, specifically glass or plastic, may have effected the results of the MIC test. Numerous other tests were also completed using larger concentrations of bacterium and in those tests it was found that there was no significant difference at all between using the glass test tubes versus plastic test tubes.

OTHER STUDIES

The studies which I performed are not the only tests showing that glass, in some circumstances, may have a detrimental effect on silver products. It has been noted in another independent study which has been cited by other researchers that silver can adsorb to glass (Chambers 1960; Thurman 1989). With this in mind, it may have been possible that the silver could have adsorbed to the surface of the glass test tubes reducing the concentration of available silver interacting with the bacteria which resulted in having to use a higher amount of silver to kill the bacteria when the glass test tubes were used.

CONCLUSION

In the test work I have completed as well as in other available studies, it was found that glass may, in some cases, have a detrimental effect on silver products. While it can be said that glass did not always show the detrimental effect, it can also be stated that

we found no problems at all with using the plastic instead of glass. Our tests, in conclusion with the other available independent study (1Chambers et al. and 2Thurman et al.), would suggest, by inference, that silver products should not be stored in glass containers which could reduce the available concentration of silver, but rather in a high quality plastic container.

Respectively,
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References

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Thurman, R. a. C. G. (1989). "The Molecular Mechanisms of Copper and Silver Ion Disinfection of Bacteria and Viruses." CRC Critical Reviews in Environmental Control 18(4): 295-314.