

OILFIELD BUGBUSTERS™

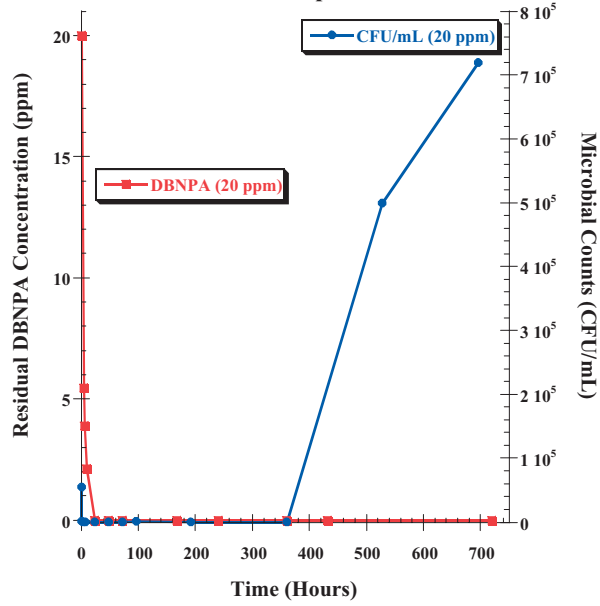
The Use of DBNPA as a Hydrotest Biocide

Protecting a pipeline from microorganisms and the potential of biofilm formation during a hydrotest requires a service company to balance several properties of their hydrotest biocide. First, the biocide must be stable and effective in the hydrotest water long enough to provide protection that lasts for the duration of the test. Second, the environmental impact of the residual biocide in the hydrotest water must be considered when deciding whether or not the hydrotest water requires chemical deactivation during discharge. The ideal hydrotest biocide would likely be one that is fast acting and efficacious at moderate use concentrations, but has a short enough half-life so that the hydrotest water does not require deactivation prior to or during discharge. DBNPA is a fast acting, broad-spectrum biocide that has a limited half-life in alkaline systems. As applied to a hydrotest application, DBNPA would be extremely effective at reducing the population of any microbes that may be present, while its limited half-life could mean that the water might not require deactivation prior to discharge.

To demonstrate the effectiveness of DBNPA in a hydrotest application, the following experiment was performed. Several liters of a representative surface water was collected from a pond (frequented by a large flock of Canada geese) and split into four samples. One sample served as the control and received no biocide, while the other three were treated with DBNPA. The concentration of DBNPA used was either 20, 100, or 200 ppm as active DBNPA. Once the samples were treated with biocide, they were stored at room temperature and assayed for both residual DBNPA concentrations and residual microbial counts for a period of 30 days. The results are shown in the following graphs.

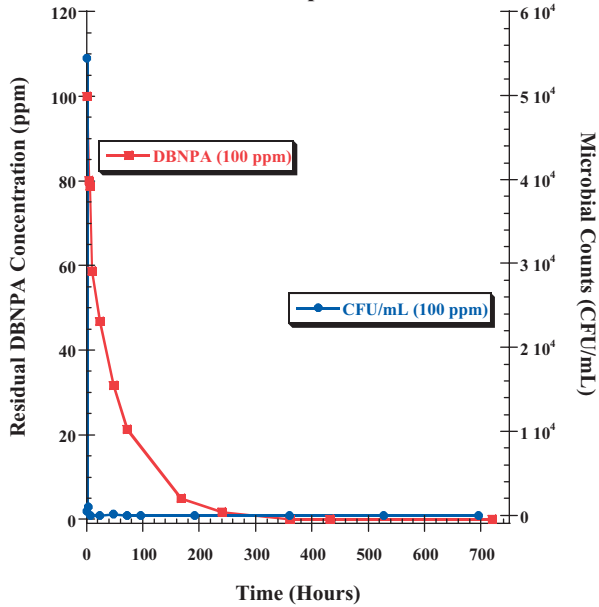
Residual DBNPA Concentration and Microbial Counts
20 ppm DBNPA Initial Concentration

Initial Microbial Population = 5.45×10^4



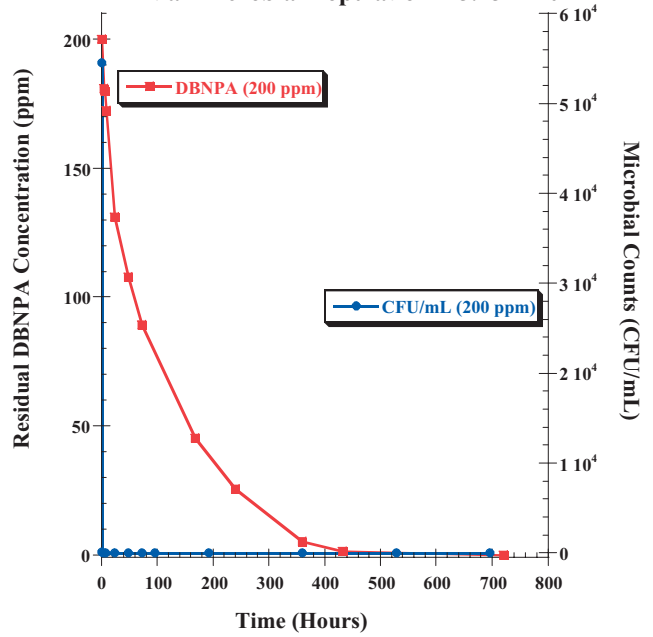
Residual DBNPA Concentration and Microbial Counts
100 ppm DBNPA Initial Concentration

Initial Microbial Population = 5.45×10^4



Residual DBNPA Concentration and Microbial Counts
200 ppm DBNPA Initial Concentration

Initial Microbial Population = 5.45×10^4



The initial microbial counts in the control sample were found to be 5.45×10^4 CFU/mL and this population held constant for the duration of the test. In the DBNPA-treated samples, the microbial counts correlated well with the residual DBNPA concentrations. In the 20-ppm sample, the DBNPA quickly degraded as expected, with no DBNPA detected at 24 hours after addition. The microbial counts in this sample were quickly knocked down by the 20-ppm treatment, but they rebounded by the end of the test. In the 100-ppm DBNPA sample, the DBNPA exhibited much better residual stability and was present for almost 2 weeks. The microbial counts were quickly reduced to 0 CFU/mL upon treatment with the 100-ppm DBNPA and they remained at 0 CFU/mL for the remainder of the test. Finally, DBNPA was detected in the 200-ppm DBNPA for almost 3 weeks in the test. The microbial counts in this sample were quickly reduced to 0 CFU/mL upon biocide treatment and were maintained at 0 CFU/mL for the duration of the test.

These results demonstrate that DBNPA is a fast-acting and broad-spectrum biocide that is capable of reducing microbial counts in surface waters to non-detectable levels in a short period of time. In addition, its limited half-life in this typical surface water suggests that it can provide longer term protection from microbial contamination while eliminating the need to deactivate any residual biocide. The combination of rapid and broad-spectrum efficacy, combined with its limited half-life in neutral to alkaline waters, make DBNPA an ideal candidate for a hydrotest biocide.

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