CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Kimberly A. Sparks

Project Number
S0818

Project Title
What's In Your Water?

Abstract

Objectives/Goals
In this project I attempted to remove nitrites from water by designing a biological filter that would be able to oxidize nitrites into nitrates. The purpose of this project was to determine if biological filters could be used to remove nitrites from contaminated well water at treatment plants in Southern California.

Methods/Materials
Nitrite contamination in Southern California well water is common because the water has been polluted by agricultural activities, namely by chicken and dairy farms. As I did not have a likely chance of obtaining samples from closed wells, I instead used feeder fish to simulate high levels of nitrite concentration. I then designed a biological filter using ceramics and bacteria as the active elements that could oxidize nitrite into nitrate.

Results
Using nitrite test kits, I ran several simulations with the affected water in which I found that the biological filter, although it took a couple of days, significantly reduced the amount of nitrites in each sample. It did not, however, reduce the nitrite contamination to .1ppm, which is the EPA standard for drinking water.

Conclusions/Discussion
Biological filters might be used in combination with other nitrite treatments to purify water at treatment plants, but cannot be used as a sole method for reducing nitrite levels as I originally thought.

Summary Statement
I attempted to remove nitrites from water by designing a biological filter that would be able to oxidize nitrites into nitrates in the hopes of salvaging polluted Southern Californian wells.

Help Received
My Dad helped me to select my materials and gave input on the primary design of my filter.