

Effects of Ultraviolet Radiation on Crystal Growth

Abstract

The objective: Taking into consideration the sensitivity and delicacy of crystal growth. I decided to subject seed crystals, taken from crystal clusters which I grew, and expose them to a continuous source of Ultraviolet light.

UV light is an electromagnetic radiation of a higher energy than visible light because of its shorter wavelength. Crystals are so sensitive that even gravity interferes with perfect growth. This led me to speculate whether a continuous stimulation of 33% UVA and 8% UVB radiation would interfere with their symmetry or their growth

Methods/Materials

I grew four different types of crystal clusters- Aquamarine, Citrine, Diamond, and Ruby. From these clusters, seed crystals were chosen, mounted, and divided into two sets of control and test crystals for each type. I called this part of my project Phase I.

In Phase II all crystals were grown in 10 to 1 supersaturated solutions and allowed to grow for 10 days.

However, the test group was subjected to continuous 33% A (aquarium light) and 8% (black light) Ultraviolet light while the control group was grown in a relatively light free environment.

Results

Both tests and controls of the Aquamarine and Citrine crystals showed significant growth while the Diamond and Ruby control and test groups formed well shaped crystals their growth was not noteworthy.

However, what was significant was the overflowing eruptions of dendritic crystals in only the test Aquamarine and Citrine specimens.

Conclusions/Discussion

The fact that my Aquamarine and Citrine crystals were created from doped (food dye) solutions of monoammonium phosphate and my Diamond and Ruby crystals from doped solutions of potassium aluminum sulfate tended to clump my experiment into two groups even though the crystal lattice of all the crystals were different.

However, the production of dendritic crystals in only the test group of the Citrine and Aquamarine made me believe that the UV radiation had an energizing effect because the control group was free of dendritic crystals.

I thought this to be significant. I'd like to do further research using UVC, a still more powerful radiation, under stricter conditions with

more varied crystals, preferably protein crystals to gain more insight into the Space Shuttle crystal experiments.

The project was to find out if Ultraviolet radiation would disturb the crystal lattice of a growing seed crystal.

Bibliography

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