

Iris Belensky

Junior Division Chemistry

Discovering New and More Energy Efficient Ways of Curing Polymer Clay

The goal of this project was to find more energy efficient methods of curing polymer clay. The polymer clay cured through alternate methods had to have comparable physical properties to the clay cured using the manufacturer's suggested method (baking). The two alternate methods I decided to do were boiling and microwaving. The three properties that I decided to compare were color, hardness and flexibility. I cured one set of samples according to the manufacturer's instructions to be used as a base for the comparisons of the physical parameters with the alternate methods. I cured additional sets using alternate methods and varying some the curing parameter. During the curing process of all sets, I kept record of the data needed to calculate the energy consumption. When all the sets were cured, I measured and compared the physical properties. For color I measured the RGB values of the samples using a digital image and a computer program. For the hardness I used a device to create imprints onto the surface of the samples and measured its diameter. For the flexibility I measured at what angle my samples would break while applying gradually increasing force. When I calculated and compared the energy consumed by each method, I found that the manufacturer's suggested method is the least energy efficient. The comparison of the physical properties revealed that the color and the hardness of the samples produced by the alternate methods matches satisfactorily to the base set. The flexibility tests demonstrated that the samples produced by the alternate methods were more brittle. The results show that the alternative methods of curing produce results which are more energy efficient and with physical properties satisfactory for usage in hobby projects.