

Jayce Negley

Junior Division Physics

Heat Wave

This project was designed to determine which materials have the best thermal conductivity. The materials tested were: Corningware/Pyroceram (glass-ceramic), Pyrex (borosilicate glass), stoneware (ceramic), and aluminum (metal). This experiment deals with convection-conduction in a medium. Conduction-transfer of heat by electron diffusion or phonon vibrations (energized molecules colliding with un-energized molecules). A hole drilled into a tile, just large enough to fit the thermometer through, was constructed to get an accurate reading of the water temperatures. Preheat the oven to 350°F, and pour one quart of water in one of the containers. Place the tile cover over the cooking ware and insert thermometer. Recording the temperature before putting in oven and every five minutes until water had reached 200°F. After cooling down, repeat the steps over for each material and average the two trials. Test results and data analysis indicated that stone ware conducted heat better then pyroceram, Borosilicate glass, and aluminum. Metal's atomic structure is made of solid columns of atoms just as in glass and ceramics. The difference is that in metals the atoms share electrons creating an electron cloud while the atoms in glass, ceramics, and glass-ceramics do not.