

Investigation 6: Heating Memory Metals

Supplies

Nitinol samples (#####)

As many possible ways to heat memory metal as are available. These may include but should not be limited to the following possibilities:

magnifying glasses
batteries (1.5 V, 6V, 9V) and alligator clips
black paper
exothermic chemical reactions
solar panels
hair dryer

Teacher Notes

So far, we have only used hot water to change Nitinol from the martensite to austenite phase. For most applications of memory metals, it is far more practical to heat the memory metal using other methods than hot water. Hot air, an electric current, light passing through a magnifying glass, heat from a chemical reaction, and many other methods of heating are possible and probably more practical than immersion in a hot water bath. In this investigation, students brainstorm and test various ways of heating memory metals. Students might try hooking a memory metal sample to a battery, a solar panel, or a series of solar panels to see if they are able to cause a transition. Exothermic reactions may also work. Students should have ample time to brainstorm, gather necessary materials, and test their ideas.