

## Investigation 4

### Acoustic Properties of Nitinol

1. Compare the two Nitinol rods you have been given. Determine which of the rods is in the martensite phase. How can you tell it is in the martensite phase?
  
2. Drop each of the Nitinol rods onto the table from a height of one meter above the tabletop. The rod should be held parallel to the tabletop as it is dropped. Note the nature of the sound that the rod produces. Would you categorize the sound of the martensite as a “thud” or a ring? How would you categorize the sound of the austenite?
  
3. Using tongs, drop the martensite rod in a beaker of boiling or near boiling. Remove it from the water with tongs. As in step 2, drop the rod onto the tabletop from a height of one meter (the rod should be held parallel to the counter as it is dropped). Note the nature of the sound that the rod produces (thud, ring, or an intermediate sound). Quickly pick it up with your fingers (it will cool off rapidly) and drop it again, making sure to note the nature of the sound. Continue to pick up and drop the rod until there is no more change in sound (about 2-3 times).
  
4. Describe the changes in sound produced as the rod cooled.
  
5. Knowing what you do about atomic structure of martensite and austenite, how might you explain the different sounds they make when dropped? How do you account for the change in sound as the rod moves from the martensite to austenite phase?