

## INVESTIGATION 5

### PURPOSE

To investigate the acoustic properties of the two rods that you used in Investigation 4.

### PROCEDURE

- a. Determine which of the rods is in the martensite phase (recall Investigation 4).
- b. Using the rod that you selected in (a), tie one end to a string and suspend it in a beaker of water on a hot plate by tying the other end of the string to a ring on the stand at the appropriate height. After several minutes, remove the rod and drop it on the counter-top from a height of 50 cm. 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, intermediate). Record the temperature of the water.
- c. Return the rod to the beaker, and turn on the hot plate at its lowest setting. Remove and test the rod at approximately 10 °C intervals. Continue until a noticeable change in sound is detected.
- d. Repeat the above procedure until the water cools to just above room temperature.

### FOLLOW-UP QUESTIONS

1. How did you decide which rod was martensite?
2. Describe the changes in sound produced as the rod was slowly heated.
3. Do the sounds produced at each temperature depend upon whether the rod is being heated or cooled?
4. How do you account for this observed change in sound?