4. Wearing goggles, gloves, and a protective apron, set up the isogenerator vertically on a stand and clamp it securely in place. Carefully loosen the cap on the isogenerator, and turn the stopcock. Release 3–4 mL of the barium solution into a small culture dish. The dish now contains the radioisotope Ba-137m, a metastable isomer.

5. Add a small drop of soap to the solution so that it spreads evenly over the bottom of the dish.

6. Immediately insert the dish into the nuclear-lab station, and start the counter. Read the total count at the end of each 10 s interval, and record the count in your data table.

7. Clean up your work area. Put equipment away safely so that it is ready to be used again. Recycle or dispose of used materials as directed by your teacher.

ANALYSIS

1. **Organizing Data** For each 10 s time interval, calculate the count per second by dividing the count by 10 s. This will give you the average count per second.

2. **Organizing Data** For each value found in item 1, calculate the actual count per second due to the source by subtracting the background count from the average count.

3. **Constructing Graphs** Plot a graph of the actual count versus the total elapsed time. Use a graphing calculator, computer, or graph paper.

CONCLUSIONS

4. **Analyzing Graphs** Select a value for the actual count near the left end of the graph and read from the graph the amount of time it took for the activity to decrease to one-half that value. Record this value as the half-life.

5. **Analyzing Graphs** Repeat the procedure in step 4 three more times, each time starting at a different place on the graph. Find the average of the four values for the half-life.

6. **Evaluating Methods** Why is using the graph a better way to find the half-life than simply using the data table?