Checking When a Polymer Stays Bent

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A workshop compares two polymer strips with the same dimensions for a panel that must spring back. It pulls each strip with the same force. The loaded bend is measured while the force is on. The residual bend is measured after the force is removed and the strip returns to 20 °C.

Strip and loading temperature	Loaded bend (mm)	Residual bend (mm)
P, 20 °C	3	0
Q, 20 °C	3	0
P, 45 °C	9	0
Q, 45 °C	9	4

1 Which readings show that P and Q are equally easy to bend under the warm test load?

(1) The two 3 mm readings

(2) The two 9 mm readings

(3) The 0 and 4 mm residual readings

(4) The two 20 °C rows alone

2 A student says equal loaded bends at 45 °C prove both strips recover equally well. Evaluate the claim using the residual readings. [1]

Answer and work

The panel must retain at most 1 mm of bend after a warm load. The workshop suspects that loading time might also affect residual bend.

3 Which strip meets the requirement in the warm test? Use the measured value. [1]

Answer and work

4 Describe how to test the effect of time under load for the chosen strip while controlling temperature. [1]

Answer and work