**Checking a Window After Its UV Film Ages**

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

A museum model tests a clear protective film before and after an aging trial. It measures the percent of incident light that passes in three bands. The exhibit requires at least 80% transmission of visible light and at most 10% transmission in each of the two ultraviolet bands.

| Film condition | Visible transmitted (%) | UV band A transmitted (%) | UV band B transmitted (%) |
|---|---|---|---|
| New | 88 | 6 | 4 |
| After aging | 87 | 7 | 16 |

**1** Which reading makes the aged film fail the stated requirements?

(1) 87% visible

(2) 7% UV band A

(3) 16% UV band B

(4) Every aged reading meets its limit.

**2** A student says the film must protect just as well because it still looks almost as clear. Select whether the readings support or refute the claim, and explain using the band that changes most. [1]

Select one

☐ Supports the claim

☐ Refutes the claim

Answer and work

A reference lamp emits light only in the visible band and in UV band A. It emits nothing in band B.

**3** Explain why a test with that lamp could miss the change that caused the failure. [1]

Answer and work

**4** Describe how to add a band B comparison that measures percent transmission instead of only the amount that reaches the detector. [1]

Answer and work