Comparing Water on Two Microscope Covers

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

A class uses two clear model covers over a microscope sample. One cover is untreated. The other has a transparent coating that attracts water more strongly than the untreated surface. Both covers cool to the same temperature in humid air. The class records how condensed water is arranged and how much of a test image can be read.

Cover	**Condensed water (mg)**	**Appearance of water**	**Test image readable (%)**
Untreated	20	Separate round drops	55
Coated	20	Thin spreading film	92

1 Explain why the stronger attraction between water and the coated surface can favor spreading. [1]

Answer and work

2 Which comparison supports the conclusion that the coating improves visibility without reducing the measured mass of water?

(1) The coated cover has 92% visibility and the same condensed mass as the untreated cover.

(2) The untreated cover has 55% visibility and more condensed water than the coated cover.

(3) Both covers have the same visibility because they hold the same mass of water.

(4) The coated cover has no condensed water because the drops are not visible.

The class tests a different film that attracts water even more strongly but is slightly cloudy before cooling. A student wants to compare the way water spreads across the two coated covers.

3 Why would an image reading alone be insufficient for that comparison? Describe another observation that would help. [1]

Answer and work

4 The class places equal amounts of water on the two covers. Identify one other condition to keep the same when comparing the area covered by water. Explain how that condition can affect the reading. [1]

Answer and work