Humidity Control for Paper Archives

Scoring guide · one credit per question · review written work against each rubric

Humidity Control for Paper Archives

Question 1

Choice (2)

Tray B takes up 33.6 − 28.0 = 5.6 g of water and contains 28.0 g of dry beads. A takes up only 4.2 g. C exceeds the dry mass limit.

Question 2

A partially positive H on a surface O–H group can attract the partially negative O of a water molecule. Also accept a hydrogen bond from a water molecule’s O–H group to an available lone pair on a surface oxygen.

Question 3

The beads take up 28.2 − 24.0 = 4.2 g of water. Dividing by 24.0 g of dry beads gives 0.175 g of water per gram of dry beads. About 0.18 g/g is also acceptable.

Question 4

Choice (3)

At 30 min the mass above the dry bead mass is 28.8 − 28.0 = 0.8 g, within the 1.0 g limit. At 15 min, 2.0 g of water remains.

Question 5

The model states that only water leaves during drying. The 4.8 g drop from 33.6 g to 28.8 g measures water lost, and the beads still weigh more than their original dry mass of 28.0 g.

Question 6

Compare freshly dried used beads with the same dry mass of unused beads. Measure the mass gain after equal time at the same humidity and temperature. Accept another matched comparison that can assess restored water uptake, with a measurable outcome and relevant control.