Checking Oxygen Loss in a Coated Iron Model

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

A classroom corrosion simulation puts the same mass of iron in three sealed chambers. The iron is untreated in J and has a different coating in each other chamber. The model starts with 10 mg of oxygen gas in each chamber. Any oxygen that forms an iron oxide stays with the dry iron sample. No other change affects the iron sample's mass, and the coating can be removed without removing the oxide.

Chamber	**Oxygen gas after test (mg)**	**Iron sample mass gain after removing any coating (mg)**
J	4	6
K	8	2
L	4	2

1 Which two chambers show the same decrease in oxygen gas?

(1) J and K

(2) J and L

(3) K and L

(4) All three

2 Calculate how much oxygen disappeared from the gas in L but was not accounted for by the mass gain of the iron sample. [1]

Answer and work

3 Use the two measurements in J and L to evaluate the claim that the same gas loss proves the same amount of oxygen entered the iron oxide. [1]

Answer and work

The simulation can put the coating from L in a new chamber on a support that cannot react with oxygen. The new chamber otherwise uses the same conditions.

4 Describe what to measure in this new trial and what result would support the idea that the coating accounts for the 4 mg gap. [1]

Answer and work