Separating Made Water From Incoming Water

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

A reaction simulation uses a mixture of hydrogen and carbon monoxide. It runs only the two reactions shown and converts all of both fuels. The incoming stream may also carry some water vapor, which passes through unchanged. The detectors collect all the carbon dioxide made and all the water leaving the simulation.

$2\ H_2 + O_2 \rightarrow 2\ H_2O$

$2\ CO + O_2 \rightarrow 2\ CO_2$

Recorded quantity	**Amount (mol)**
O_2 consumed	0.050
CO_2 collected	0.040
Total water collected	0.080

1 Calculate the total amount of H_2 and CO consumed together. Use both equations and the O_2 reading. [1]

Answer and work

2 How much of that combined amount is CO?

(1) 0.020 mol

(2) 0.040 mol

(3) 0.080 mol

(4) 0.100 mol

3 A student assigns all 0.080 mol of collected water to the first reaction. Evaluate the claim by calculating the amount of water made from H_2 and the amount carried in. [1]

Answer and work

A repeat uses the same dry amounts of both gases. It supplies no incoming water vapor and again collects all products.

4 Predict which of the three readings changes in the dry repeat and give the new value. [1]

Answer and work