Checking a Reusable Catalyst After Rinsing

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

A classroom simulation follows the decomposition of hydrogen peroxide. Each run starts with the same amount of hydrogen peroxide at the same temperature. The simulation records oxygen gas volume at the same pressure and temperature. In some runs the model puts a solid catalyst in contact with the solution.

$2H_2O_2(aq) \rightarrow 2H_2O(l) + O_2(g)$

Run	**Oxygen after 30 s (mL)**	**Oxygen after reaction ends (mL)**
No catalyst	4	40
Clean catalyst	24	40
Used catalyst	10	40
Used catalyst after rinsing	22	40

1 Use one pair of results to explain how the clean catalyst changes the rate without changing the amount of oxygen produced when the reaction ends. [1]

Answer and work

2 Which comparison gives the most direct evidence that rinsing the used catalyst can restore much of its early effect?

(1) No catalyst and clean catalyst

(2) No catalyst and used catalyst

(3) Used catalyst and used catalyst after rinsing

(4) Clean catalyst and used catalyst

3 According to the equation, how many moles of hydrogen peroxide react for every 0.015 mol of oxygen produced? Show the mole ratio. [1]

Answer and work

A student proposes that handling and moving the used solid, by itself, could change its early effect. The class can split a comparable used sample into two portions.

4 Describe how to use the two portions to separate the effect of rinsing from the effect of handling. State what result to compare. [1]

Answer and work