Tracking Neutralization as a Solid Dissolves

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

A classroom model contains dissolved hydroxide and some solid that can supply more hydroxide as it dissolves. Each mole of OH^- neutralizes one mole of H^+. In this model the already dissolved hydroxide reacts first. A rinse initially supplies 0.006 mol H^+. Assume the two portions of solid fully dissolve at the stages shown.

Source of hydroxide	**Amount made available (mol)**
Already dissolved	0.004
First portion that later dissolves	0.003
Second portion that later dissolves	0.003

1 How much H^+ remains just after the already dissolved hydroxide reacts?

(1) 0.002 mol

(2) 0.003 mol

(3) 0.004 mol

(4) 0.006 mol

2 After the first solid portion dissolves, state which ion is now in excess and find its amount. [1]

Answer and work

3 A student says the mixture cannot neutralize the rinse because it initially contains only 0.004 mol dissolved hydroxide. Evaluate the claim. [1]

Answer and work

The model repeats the test after removing the undissolved solid from a fresh mixture. Assume removing it does not change the original 0.004 mol of dissolved hydroxide.

4 Compare which ion remains in excess after all available hydroxide reacts in the unfiltered and filtered trials. [1]

Answer and work