The effect of Substrate pH on Enzyme Activity

Background Information:
The enzyme catalase is found in the cells of living organisms. Catalase breaks poisonous hydrogen peroxide into harmless water and oxygen gas. Catalase is readily available in blood. A good source of this is fresh liver.

Problem: What is the optimum pH for the enzyme catalase?

Hypothesis: _____

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Aim: To observe how substrate pH affects the relative activity of the enzyme catalase.

Materials: 6 test tubes, hydrogen peroxide solution (6%), liver tissue, scalpels, sulfuric acid, sodium hydroxide, safety glasses, gloves, marker pen.

Method:

1. Set up five experimental test tubes as described below.
2. Determine the starting pH of the hydrogen peroxide.
3. Add drops of sulfuric acid to make the hydrogen peroxide more acidic,
4. Add drops of sodium hydroxide to make the pH more basic/
5. Use the pH meter to determine pH before the liver is added.
6. Determine the enzyme activity by measuring the height of the oxygen bubbles in each test tube.
7. Record your results in a table
8. Plot your results on a graph.

Test Tube A pH 1	**Test Tube B** pH 3	**Test Tube C** pH 5	**Test Tube D** pH 7	**Test Tube E** pH 9
2ml hydrogen peroxide + liver	2ml hydrogen peroxide + liver	2ml hydrogen peroxide + liver	2ml hydrogen peroxide + liver	2ml hydrogen peroxide + liver