

Colloidal Science Laboratory

Laboratory Report

Date: 20 Jan 2001

Introduction

This report is to document the details of an experiment conducted on this date at the Colloidal Science Laboratory, Westampton, NJ by Francis Key, principal scientist. The experiment involves the determination of whether fine silver wire will dissolve in hydrochloric acid pH=2 when immersed for a period of 26 hours.

Purpose

This experiment is to determine the extent, if any, that fine silver (99.999%) will be dissolved by hydrochloric acid of pH=2. The pH value approximates the pH of hydrochloric acid found in the human stomach.

Test subject

The test was performed on a piece of fine silver wire with the following measured parameters:

1. Purity = 99.999 % fine silver
2. Diameter = 2.00 mm
3. Length = 30.68 mm
4. Weight (mass) = 0.98716 g
5. Acid immersion = 26 hours

Procedure

The acid was prepared by adding 0.97g of 37% HCL to 1 liter of DI water to produce a pH=2 diluted HCL. 50 mL of diluted acid was placed in a 50 mL vial and the silver wire test sample was added to the vial. The vial was stored at room temperature for a period of 26 hours to act on the silver wire. At the end of the test period, the wire was removed, and rinsed in DI water and dried, then weighed.

Measurements

The measurements were performed using an A&D Analytical Balance, Model HM-202 that measures grams to 5 decimal places. The least significant digit is 10 micrograms.

Results

The wire test sample weighed 0.98716 g after being immersed in the acid for 26 hours. This is the same as it weighed before the acid bath, so the acid dissolved no measurable silver.

Conclusions

Hydrochloric acid pH=2 does not dissolve a measurable amount of silver when left in the acid for 26 hours. This finding is consistent with chemistry handbooks that state that silver is not attacked (dissolved) by hydrochloric acid.