NOTES ON QUALITATIVE ANALYSIS

RALPH W. HUFFERD, DePauw University.

ZINC.

Considerable uncertainty arises in the use of either hydrogen sulphide or potassium ferrocyanide as a direct test for zinc after the removal of aluminium hydroxide. The presence or absence of chromium also seems to afford two distinct conditions when zinc is sought by the inexperienced student.

The writer avoids these difficulties by always having a colored solution prepared by adding chromate if absent, and by removing a sufficient amount of the zinc from the main solution for distinct tests under unvarying conditions.

Method.—If chromium is absent (solution colorless), after removing aluminium hydroxide, add about five drops of dichromate solution. Acidify the ammoniacal solution with acetic acid, using the color change from chromate to dichromate as an indicator. A few cubic centimeters excess can do no harm. Saturate 5 cc. water with hydrogen sulphide and add the resulting solution to the above acidified solution. Let stand for a minute or two and filter, returning the filtrate to the filter about three times. As a general rule, if zinc is present, a flocculent precipitate is easily seen and filtered off; but if it is absent, a solution of milk of sulphur, which appears quite clear but milky, results.

Wash the filter with hot water and then pass through it a hot solution of 2 cc. 6N hydrochloric acid in 10 cc. water. Pass the filtrate through again (hot) and boil to expel hydrogen sulphide. Cool, make alkaline with ammonia, acidify with acetic acid, and divide into two portions. To one part add four or five drops of ferrocyanide solution and to the other 2 cc. saturated hydrogen sulphide water. White precipitates of zinc ferrocyanide and zinc sulphide respectively are obtained if zinc is present.

CALCIUM.

The difficulty which some students experience in making precipitation tests in colored solutions has led most writers to advise a second precipitation of calcium and strontium as carbonates after removing barium as the chromate. The writer avoids this difficulty by making a very definite control test.

Method.—After removing barium and detecting strontium by the customary side test with calcium sulphate solution, add excess ammonium sulphate solution and boil down the solution to about four-fifths volume. Filter hot. Boil down the filtrate to about 15 cc. and filter through the original filter until perfectly clear. Divide into two equal portions in large test tubes and dilute with three volumes

"Proc. Ind. Acad. Sci., vol. 36, 1926 (1927)."

of hot water. To one tube add one drop of saturated calcium sulphate solution and shake to mix. To each tube add five drops of ammonium oxalate solution. Stopper the tubes and shake for about two minutes. Compare the two. A white precipitate at least as heavy as the one in the tube to which the calcium sulphate was added should form in the second if calcium is present.

AN INDESTRUCTIBLE STEAM BATH.

RALPH W. HUFFERD, DePauw University.

The lack of durability and high cost of commercial constant-level steam-baths put out by supply houses led the writer to devise one from standard plumbing supplies. This bath has been found to be very satisfactory and practically indestructible. The cost is about one-third that of those on the market.

The bath consists of a standard pipe coupling with a plug screwed in. The constant-level device is made up by screwing two ½-inch nipples 1½ inches long into a ½-inch T. Into the third opening of the T is screwed a one-hole rubber stopper carrying a piece of glass tubing. This tube is raised or lowered to regulate the level. Water is introduced by means of a second piece of tubing bent into the shape of a hook and hung into the top nipple.

To attach the leveling device, a hole is drilled into the coupling just above the plug. The hole is threaded.

The writer has baths made from both four and five-inch couplings. When needed, rings from discarded commercial baths are used.