ANALYSIS OF NITRIC ACID.

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Chemistry has to deal with the composition of things. Hence, any experiment that illustrates in a simple way the composition of the common chemical compounds is a valuable one for beginning students in chemistry.

Most texts take up the study of acids, bases and salts, and the composition of ammonia before the study of nitric acid, so the student is able to grasp the full meaning of the experiment as here given.

(a) Any solution that contains hydrogen ions will turn blue litmus red. Add a drop of nitric acid to a strip of blue litmus paper. It turns red, hence nitric acid contains hydrogen.

(b) Into a test tube put 4 or 5 c.c. of water, add 10 or 12 drops of concentrated nitric acid and stand in the test tube rack, or an empty wide-mouthed bottle. Add a piece of sodium hydroxide about twice as large as a good sized pea and shake a few times, then add a few pieces of aluminum wire and, if necessary, heat over the Bunsen flame until the action is quite vigorous. Test the odor of the escaping gas and note its action on moist red litmus paper. It is very evident that ammonia is liberated. When sodium hydroxide is placed on aluminum, hydrogen is liberated and the nascent hydrogen reduces the nitric acid, forming ammonia and water. The student already knows the composition of ammonia and can readily reason that the source of the nitrogen must be from the nitric acid.

(c) Place about a gram of coarsely powdered iron sulphide in a test tube, cover with concentrated nitric acid, and heat a few minutes in a hood. Allow the solution to cool, dilute with two or three times its volume of distilled water, decant a portion of the dilute solution and test for the SO_4 ion by adding barium chloride. A heavy white precipitate of barium sulphate indicates the presence of the SO_4 ion. The student can readily reason out the source of the oxygen. The experiment thus shows nitric acid to be composed of hydrogen, nitrogen and oxygen.