

adhesive tape and fish glue prevented the tube from slipping through the clamp.

When the temperature of the air-bath had become 33°C the sounding tube was clamped at C and set into vibration as before. Then the apparatus was removed from the thermostat and the dust-heaps were measured to 0.5 mm. The readings were averaged by the method proposed by Kundt.¹ Repetitions of this procedure gave a series of readings as checks on the measurement.

The wave length in air, λ_1 , was obtained at the same time by inserting the end A of the sounding tube into a glass tube about 3 cm diameter and 50 cm long, containing precipitated silica. The temperature of the air was determined by two thermometers at either end of the tube and the dust heaps were measured as in the gas cylinder.

When a sufficient number of readings had been made, the capillary containing the water was broken. To insure distribution of the moisture throughout the nitrogen peroxide the gas cylinder was heated and cooled several times and the inner tube BG moved backwards and forwards. The gas cylinder was then left in the thermostat for twenty-four hours. With the nitrogen peroxide now definitely known to contain water vapor another wave-length measurement was made.

To determine the weight of nitrogen peroxide in the gas cylinder, the bulb K was immersed in liquid air until no color could be distinguished by looking longitudinally through RD. After the bulb was sealed off at E and dried, it was placed in a desiccator for half an hour and was then weighed. Both the bulb and a standardized solution of potassium permanganate were cooled in ice and then the top of the bulb was broken and held under the solution. In this way all the nitrogen peroxide was absorbed by the potassium permanganate. (No odor of the gas was distinguishable above the solution.) The permanganate reduced by the nitrous acid was determined by titrating with freshly standardized ferrous sulphate solution.

¹ Pogg. Ann., 127, 497 (1866).