STANDARDIZING HYDROMETERS.

By Prof. W. P. Mason.

Some time since I prepared standard instruments, arranged for liquids lighter than water, for one of our large corporations. The hydrometers were constructed by Chas. J. Tagliabue; the stems left unmarked and the tops open.

Each instrument (there were four in a set) had a capacity of but 20° Baumé; the four thus covering the scale from 10° to 90° B.

Upon each stem I determined three points, upper, middle and lower, and fixed thereon the permanent paper markings. In obtaining these points I employed Clarke's method, weighting the instrument internally and using water at 60° F. as the floating liquid. The papers having been placed and fastened the added weights were removed and the stems were then closed before the blowpipe.

As a check, the closed hydrometers were next floated in prepared liquid (oils generally) at 60° F., of specific gravities *exactly* equal to the indications on the paper markings, and the points where the liquids cut the stems noted by slight file scratches.

What is particularly worthy of attention is the lack of uniformity in the readings as determined by the two methods.

Greater care could not have been exercised than was given during the entire work, and I am forced to ascribe the variations in reading (not far from $\frac{1}{10}$ of a degree) to differences of surface attraction in the several liquids. Such differences would naturally result in the mounting of liquids to unequal heights up the stem of the hydrometer; and, moreover, even granting that the volume of liquid mounting the stem were constant, yet the varying specific gravity thereof would always enter as a disturbing factor of the total weight of the instrument.

From my work in this matter I am convinced that hydrometers should be standardized by floating in water alone, according to Clarke's method; and I would further add that I believe a degree of delicacy is often demanded of them beyond what their capabilities can bear.

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