

NOTES

DETERMINING SOIL MOISTURE RAPIDLY AND ACCURATELY BY METHYL ALCOHOL

In a former communication¹ the use of alcohol was proposed as a basis for a very rapid means of determining the moisture content of soils and possibly of other materials. The form of alcohol that was then suggested was ethyl alcohol. In order to ascertain whether there are other liquids that would be more satisfactory than ethyl alcohol, an investigation has been conducted in which a large number of liquids have been examined.

It has been discovered that of all the liquids studied, methyl alcohol seems to be the most satisfactory, as it is the most powerful dehydrating agent. Indeed, this form of alcohol seems to be able to replace or reduce the moisture content of soils down to practically the absolutely dry basis, as will be readily seen from the data below. These data were obtained by placing about 20 grams of air-dry soil in a 100 cc cylinder, drying it in an oven at 110° C for 24 hours, cooling it in a desiccator, and then trying to recover the water added by 50 cc of alcohol. This would seem to be a more accurate and reliable procedure than taking duplicate samples from moist soil for comparison, since it is so difficult to take absolutely duplicate samples.

Percentage of water recovered from water added to oven-dry soils

Sand	100.05
Loam	100.03
Clay	99.99
Muck	99.01
Silica gel	99.30

These results indicate that by the use of methyl alcohol the moisture content of soils can be determined as absolutely as by the oven method. These results may appear incredible, but they have been checked in various ways. It is possible in some cases, as in mucks, that any traces of water that the alcohol fails to extract or replace, are compensated by traces of material that the alcohol may dissolve out.

By this method the hygroscopic moisture content of soils can also be determined.

Although not extensively studied, it seems probable that the methyl alcohol can also be used to determine the moisture content of flours and possibly of other organic materials. Here, however, an error may arise due to some substance dissolved out by the alcohol.

¹This JOURNAL, Vol. 19: 469-471. 1927.