

Title Direct Spectrophotometric Determination of Moisture Content of Grain and Seeds
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Abstract

The water absorption bands at 0.76, 0.97, 1.18, 1.45, and 1.94 μ were investigated for spectro-photometric measurement of the moisture content of grain and seeds. The spectral absorbance curve for a thin layer of ground wheat was measured for the 1.0- to 2.3- μ region, showing that the 1.94- μ band of water has a minimum of interference. Using a 2-gram sample of ground material mixed with 1.5 to 2.0 ml of carbon tetrachloride in a 4.4-cm diameter cell, the transmittance values of a large number of wheat, soybean, wheat flour, and wheat bran samples were measured at 1.94 and 2.08 μ . From these data, the optical density difference ΔOD (1.94-2.08) μ was computed for each sample and related to the moisture content as determined by standard procedures. Calibration curves obtained for each of the four materials showed standard deviations from 0.28 to 0.37 per cent moisture for the moisture range from 0 to 20 per cent. The water absorption band at 0.97 μ was measured on individual intact peanuts and related to the moisture content. A measurement within ± 0.7 per cent moisture content was obtained, using ΔOD (0.97-0.90) μ as the measured value. The authors conclude that moisture determination by direct spectrophotometry is practical on grain and should be possible on a wide range of solids.