

Applications Note

CARBOXYL METHYL CELLULOSE IN WATER

This substance is used in the mining industry - especially for precious metals, as a depressant in the floatation process. By measuring the concentration of the compound when dispersed in water, the quality control department can maximise the recovery of precious metal. Such are the economics of the industry that the investment in the instrument can be recouped in a very short time once the application has been proved.

An Index Instruments distributor approached the Company and sent a sample of the powder for trial. Sample preparation is relatively straightforward, the sample is carefully weighed and slowly dispersed in water using a magnetic stirrer. When dispersed it is ready for measurement and the results obtained have been plotted on the attached graph. The concentrations used in these measurements ranged from 0.5% to 3.0% wt/vol. All measurements were made at 20°C using a GPR 12-70X refractometer fitted with an FC1 hinged sample cover and connected to an LTD 6 Thermocirculator for accurate temperature control **. For the greatest reproducibility, it is advisable to take the sample measurement as soon as possible after the dispersion is complete. As expected, the graph is a straight line. The refractometer gave a readout with a resolution of 0.00001 RI. Accuracy is ± 0.00005 RI (± 0.01 Brix).

If higher accuracy is required, the sample can be measured in the TMR 33-37 refractometer with an accuracy of ± 0.00002 RI. The higher concentration samples (2% and above) are surprisingly viscous but are handled with ease by the built-in sampling pump.

The RS232 serial output can be connected to a computer or printer to a chart recorder for data collection. Further sophistication, e.g. for connection to process control instrumentation, may also be possible.

** An alternative to the GPR 12-70 and LTD 6 Thermocirculator would be the PTR 46X refractometer with Peltier cell internal temperature control.

Table of results for plotting Refractive Index of Carboxy Methyl Cellulose against Concentration.

Concentration (Wt / Vol)	Refractive Index
0.52 %	1.33374
0.61 %	1.33386
0.74 %	1.33405
0.81 %	1.33416
0.96 %	1.33436
1.15 %	1.33464
1.30 %	1.33486
1.44 %	1.33507
1.61 %	1.33531
1.93 %	1.33577
2.07 %	1.33598
2.21 %	1.33619
2.41 %	1.33647
2.69 %	1.33687
2.97 %	1.33729

PLOT OF REFRACTIVE INDEX/CONCENTRATION
OF CARBOXY-METHYL-CELLULOSE

