the plastic and pressing the plastic cylinder against the hot screen to melt the plastic and bond the screen to the plastic cylinder.

The modified thickness meter used to measure the expansion of the sample while absorbing the saline solution is a Mitutoyo Digimatic Indicator, IDC Series 543, Model 543-180, having a range of 0–0.5 inch and an accuracy of 0.00005 inch (Mitutoyo Corporation, 31-19, Shiba 5-chome, Minato-ku, Tokyo 108, Japan). As supplied from Mitutoyo Corporation, the thickness meter contains a spring attached to the probe within the meter housing. This spring is removed to provide a free-falling probe which has a downward force of about 27 grams. In addition, the cap over the top of the probe located on the top of the meter housing is also removed to enable attachment of the probe to the suspension spring 5 (available from McMaster-Carr Supply Co., Chicago, Illinois, Item No. 9640K41), which serves to counter or reduce the downward force of the probe to about 1 gram, ±0.5 gram. A wire hook can be glued to the top of the probe for attachment to the suspension spring. The bottom tip of the probe is also provided with an extension needle (Mitutoyo Corporation, Part No. 131279) to enable the probe to be inserted into the sample cup.

To carry out the test, a 0.160 gram sample of the absorbent material, which has been sieved to a particle size between 300 and 600 microns, is placed into the sample cup. The sample is then covered with a plastic spacer disc, weighing 4.4 grams, which is slightly smaller than the inside diameter of the sample cup and serves to protect the sample from being disturbed during the test. The 100 gram weight is then placed on top of the spacer disc, thereby applying a load of 0.3 pound per square inch. The sample cup is placed in the Petri dish on the platform of the laboratory jack raised up until it contacts the tip of the probe. The meter is zeroed. A sufficient amount of saline solution is added to the Petri dish (50–100 milliliters) to begin the test. The distance the weight is raised by the expanding sample, as it absorbs the saline solution, is measured by the probe. This distance, multiplied by the cross-sectional area inside the sample cup, is a measure of the expansion volume of the sample due to absorption. Factoring in the density of the saline solution and the weight of the sample, the amount of saline solution absorbed is readily calculated. The weight of saline solution absorbed after 60 minutes is the AUL value expressed as grams saline solution absorbed per gram of absorbent. If desired, the readings of the modified thickness meter can be continuously input to a computer (Mitutoyo Digimatic Miniprocessor DP-2 DX) to make the calculations mnd provide AUL readings. As a cross-check, the AUL can also be determined by determining the weight difference between the sample cup before and after the test, the weight difference being the amount of solution absorbed by the sample.

EXAMPLES

Example 1

A sodium carboxymethyl cellulose, commercially available from the Aqualon Company under the trade designation AQUALON™ Cellulose Gum CMC-7HCF, is provided. The carboxymethyl cellulose has an average degree of substitution of 0.7. Ten grams of the carboxymethyl cellulose is added to an aqueous solution containing 40 grams of distilled water and 0.3 gram of aluminum chloride. The carboxymethyl cellulose "absorbs" the aqueous mixture. The carboxymethyl cellulose is then dried in a Blue M air convection oven at a temperature of about 80° C. for about five hours. After drying, the carboxymethyl cellulose is subjected to Absorbency Under Load testing. The carboxymethyl cellulose so formed is found to have an AUL value of about 16.6 g/g. A control sample of the carboxymethyl cellulose (AQUALON™ Cellulose Gum CMC-7HCF) is also subjected to Absorbency Under Load testing in the form in which it is commercially received. The control carboxymethyl cellulose is found to have an AUL value of about 3.8 g/g.

It is seen that the surface crosslinking of the present invention produces a carboxymethyl cellulose having a dramatically improved AUL value (16.6) compared to the non-crosslinked control (3.8).

Example 2

A surface-crosslinked, sodium carboxymethyl cellulose is prepared as set forth in Example 1 with the exception that the amount of aluminum chlortie present in the aqueous mixture ts varied. Specifically, the milligrams of aluminum chloride per gram of sodium carboxymethyl cellulose is varied from 0 milligrams per gram of carboxymethyl cellulose (control) to 120 milligrams per gram of carboxymethyl cellulose. The resultant surface-crosslinked, carboxymethyl celluloses are subjected to Absorbency Under Load testing.

A bulk-crosslinked comparison sample is prepared using the same carboxymethyl cellulose as in Example 1. The bulk-crossltnked material is prepared by dissolving 1 gram of carboxymethyl cellulose in 2,000 grams of distilled water. An amount of aluminum chloride from 0 milligram per gram of carboxymethyl cellulose to 150 milligrams per gram of carboxymethyl cellulose is added to the aqueous solution of carboxymethyl cellulose. The carboxymethyl cellulose is recovered by drying (<5 percent moisture content) and is subjected to Absorbency Under Load testing. The results of this testing are set forth in Table 1 and are graphically illustrated in FIG. **2**.

TABLE 1

	AUL (g/g)	
$AlCl_3$ (mg/g)	Surface Crosslinked	Bulk Crosslinked*
0*	3.8	3.8
30	10.2	
45	11.6	
60	14.3	6.8
75	11.2	
100	8.3	8.9
120	6.1	
150		6.7

*Not an example of the present invention

As can be seen from reference to Table 1 and FIG. **2**, the surface crosslinking of the present invention improves the AUL values compared to a bulk-crosslinking process at equivalent crosslinking agent concentrations over a wide range of crosslinking agent concentrations. As may be seen from Table 1, however, if too high of a crosslinking agent concentration is used for a particular crosslinking agent, the degree of surface crosslinking of the modified polysaccharide achieved may be so high as to result in undesirable absorbent properties.

Example 3

Surface-crosslinked, sodium carboxymethyl celluloses are prepared according to the method of Example 1 with the exception that different crosslinking agents in varying