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amounts are employed. The crosslinking agent, and the form in which it is supplied, and its concentration in millimoles per gram of sodium carboxymethyl cellulose and milligrams per gram of sodium carboxymethyl cellulose, are set forth in Table 2. These surface-crosslinked, carboxymethyl celluloses so produced are subjected to AUL testing and the results are also set forth in Table 2. Control samples employing crosslinking agents of metal cations having a valency of 2 are also produced. These control samples are subjected to AUL testing and the results set forth in Table 2.

TABLE 2

Crosslinking Agent	Molecular Weight	mMol/g	mg/g	AUL (g/g)
AlCl ₃	133.5	0.225 ¹	30	14.6
Al ₂ (SO ₄) ₃ ·14H ₂ O	594.0	0.265	155	8.1
		0.225	134	9.8
		0.150	90	10.3
		0.112 ¹	65	13.2
Ce(NH ₄) ₄ (SO ₄) ₄ ·2H ₂ O	632.1	0.225	142	10.0
		0.190	120	11.2
		0.169 ¹	106	8.7
		0.338 ¹	46	4.6
ZnCl ₂ *	136.3	0.338 ¹	46	4.6
CaCl ₂ ·2H ₂ O*	147.0	0.338 ¹	50	4.1

*Not an example of the present invention

¹"Underlinking" indicates that the carboxymethyl cellulose is crosslinked by the same number of positive charges per gram of carboxymethyl cellulose.

Reference to Table 2 or tetravalent metal cations, such as those of aluminum and cesium, produce higher AUL values than divalent cations, such as those of zinc and calcium, at equivalent positive charges per gram of carboxymethyl cellulose.

Example 4

Commercially available sodium carboxymethyl celluloses, available from the Aqualon Company, are provided. The sodium carboxymethyl cellulose materials have varying molecular weights, as reflected in viscosity of a 1 weight percent solution at 25° C., and varying degrees of substitution. Ten grams of the various carboxymethyl cellulose are added to an aqueous solution containing 40 grams of distilled water and 0.3 gram of aluminum chloride (0.6 gram of aluminum chloride are used for the CMC-9H4F). The carboxymethyl cellulose absorbs the water and is then dried in a Blue M air convection oven at 80° C. for five hours. The exact degree of substitution and molecular weight, as reflected in viscosity, is set forth in Table 3. The samples thus prepared are subjected to AUL testing and the results set forth in Table 3. Control samples of each of the commercially available carboxymethyl cellulose materials are also subjected to AUL testing and the results set forth in Table 3.

TABLE 3

Aqualon Trade designation	Viscosity (cps)	Degree of Substitution	AUL (g/g)	
			Control	Crosslinked
CMC-7H	1,500-3,000	0.65-0.95	3.7	14.2
CMC-7HCF	1,000-2,800	0.65-0.95	3.1	12.6
CMC-7H4F	2,500-6,000	0.65-0.95	4.6	16.5
CMC-12M8	800-1,600	1.15-1.45	1.3	7.7
CMC-9H4F	2,500-6,000	0.80-0.95	4.4	14.3

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As can be seen from reference to Table 4, higher molecular weight carboxymethyl cellulose generally produces higher AUL values.

Example 5

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 a particle size range of from 300 to 600 microns. Ten grams of the carboxymethyl cellulose, as commercially supplied, is first swollen with water in an amount of from 0 gram of water per gram of carboxymethyl cellulose to 20 grams of water per gram of carboxymethyl cellulose. The samples thus treated are then surface crosslinked by adding the carboxymethyl cellulose to a mixture comprising 40 grams of water and 0.3 gram of aluminum chloride. The carboxymethyl cellulose absorbs the mixture of water and aluminum chloride and is subsequently dried to a moisture content of less than about 5 weight percent. The surface-crosslinked, sodium carboxymethyl celluloses as thus prepared are subjected to AUL testing and the results set forth in Table 4.

TABLE 4

Amount of Water ¹ (g/g)	AUL (g/g)
0	14.9
5	14.4
10	12.2
20	10.8

¹Prior to surface crosslinking

As can be seen from reference to Table 4, the Absorbency Under Load values tend to decrease as the amount of water absorbed by the carboxymethyl cellulose prior to surface crosslinking increases.

While the present invention has been described in terms of the specific embodiments described above, numerous equivalent changes and modifications will be clear to those skilled in the art. Accordingly, the specific examples described and set forth above are not intended to limit, in any manner, the scope of the invention as set forth in the appended claims.

What is claimed is:

1. A crosslinked, modified polysaccharide formed by a method comprising the following steps:

forming a mixture comprising water and a crosslinking agent wherein the crosslinking agent is water soluble and comprises a compound having at least two functional groups or functionalities capable of reacting in an aqueous solution with a carboxyl, hydroxyl, or amino group of a modified polysaccharide;

adding to said mixture an amount of a water-soluble, modified polysaccharide, that is free from a substantial degree of crosslinking, such that the weight ratio of water-soluble, modified polysaccharide to water in said mixture is from about 1:2 to about 1:40, wherein said water-soluble, modified polysaccharide becomes crosslinked, and wherein said crosslinked, modified polysaccharide comprises a substantially non-crosslinked, water-soluble, modified polysaccharide core and a crosslinked, water-insoluble, modified polysaccharide shell at least partially surrounding said core, said crosslinked, modified polysaccharide being swellable in said mixture; and