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APPENDIX

APPENDIX A

Absorbency under load

Absorbency under load (AUL) measures the ability of a polymer to absorb fluid while under a static load and can be considered as a measurement of gel stability or gel strength. Similar information has been collected on water-swellable gels by measurements of the swelling pressure, which is the pressure generated by the gel in contact with an external source of fluid while being confined to a give volume. The test has been developed to measure under conditions that simulate those in the actual personal-use application. For example, the polymer in a diaper with occasionally be under a compressive load when a baby-sits or lies on the diaper.

A porous filter plate is placed in a petri dish and fluid (such as 0.9% sodium chloride solution or water) is added so that the liquid level is equal to the top of the filter plate. A filter paper is placed on the filter plate and allowed to thoroughly wet with fluid. Polymer (0.16 gram) is carefully scattered onto the filter screen of the test device (a flexiglass cylinder with 100 mesh stainless steel cloth in the bottom: cylinder diameter = 26 mm, height = 35 mm). A piston assembly, including additional weight to achieve a load, is placed on top of the polymer. After weighing the assembled device, it is placed on the filter plate, and absorption is allowed for 1 hour. After 1 hr, the entire device is reweighed and the absorbency under load is calculated by the following formula:

$$\text{AUL} = \frac{\text{(mass of cylinder group after suction} - \text{mass of cylinder group dry)}}{\text{(initial sample mass of the polymer)}}$$

VITAE

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