



Water Content by Hand Held Refractometer

Overview:

A key characteristic of a hydrogel material such as those used for the fabrication of soft contact lenses is its equilibrium water content. This is the amount of water the material is able to absorb when it is placed into an aqueous environment. The water content will have a major influence on a range of properties including oxygen permeability, refractive index and mechanical characteristics. It is therefore essential to determine accurately the water content of a material to ensure it is suitable for the intended application.

The refractive index of a hydrogel contact lens material is a function of refractive indices of its water and solid components, relative to the proportion of the material occupied by those components according to the principle of Gladstone and Dale. The water content of a hydrogel can be determined by use of a hand held refractometer. This method assumes the dry refractive index is constant for a material and then provides a value for the water content based on its relationship to the refractive index of the hydrated sample.

Procedure:

Samples are placed on the prism of the hand held refractometer and the cover is closed. Hold the refractometer towards the light and adjust the eyepiece until the scale is in focus. The junction between the light and dark area as viewed through the eyepiece indicates the water content of the material. This measurement procedure is repeated until sufficient numbers of samples are measured to ensure an accurate value is obtained.