E 63 EFFECT OF FRESH WATER AND SEA WATER ON DIFFERENT GRADES OF CREPE RUBBER

L M K Tillekaratne, M C S Perera and H V K Rodrigo

Absorption of water by the natural rubber hydrocarbon, which is basically a hydrophobic material is an osmotic process, the mechanism of which depends mainly on the presence of polar non rubber substances such as proteins in the rubber. It has been reported that fine fibres of proteins present in the rubber will act as "Wicks" for the absorption of moisture through this wasterproof material; and on this basis even the mechanism of drying of natural rubber is explained.

An attempt was made to study the tendencies of different grades of latex crepe rubber, containing varying amounts of proteins depending on the process of manufacture, to absorb both water and sea water. This study is important to the rubber industry in two ways: (a) There is lot of interest among scientists to identify polymers with high ability to absorb moisture and swell, because they could then be used for making self sealing water pipe sealing rings (b) NR is exposed to sea water and rain during transit and hence the identification of the sensitivity of each of these grades to both sea and fresh water will indicate the necessity to take special precautions in the transportation of sensitive grades.

Results clearly indicate that though the yellow fraction rubber contains most of the non-rubber constituents in natural rubber latex, its higher tendency to absorb moisture (or brine) has no adverse effect on the Plasticity Retention Index (PRI) because of the high dosage of natural antioxidants concentrated in that grade.

But fractioned rubber containing the minimum amount of non-rubber constituents absorb similar amounts of water through the protein layer encapsulating the rubber particle but reduces its PRI much faster than the yellow fraction, due to a reduced dosage of natural antioxidants.