

I. SOLUBILITY OF SUCROSE

INTRODUCTION

The solubility of sucrose in molasses is of considerable importance in the sugar industry. It has a direct interest in that the solubility relationships determine the amount of sugar which can be recovered by crystallisation. Apart from this, the rate of crystallisation and the rate of nucleation are both functions of the supersaturation of the solution, the latter being calculated using the solubility value for the solution.

In studying the problems of solubility, crystallisation and nucleation, work can be carried out using either molasses or pure solution of known composition. The present work deals with the application of a new method of determining solubilities. Unfortunately this method is not suitable without modification for use with molasses, and the work has therefore been confined to pure solutions. Few reliable data exist however, even for pure solutions, so that there is need for considerable work in this field.

(1) By the Saturation method.

(2) By the Light Diffusion method.

The principle of the saturation method is as follows :-

Two vessels are placed in a copper block to ensure that they are at the same temperature. One contains excess solid in contact with the solution and the other a known weight of solid dissolved in any convenient amount of water. The vessels and copper block are placed in an evacuated container which is kept in a thermostat. Water vapour distils from the vessel containing the weighed solid to the vessel containing the saturated solution, which is kept saturated by the presence of crystals. When equilibrium is reached, after two days or more, the weighed vessel contains