NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.
The great deviations in surface energy as established by the usual methods are ascribed to the fact that most of those methods depend on solid - solid interaction. Here it is proposed to work with solid - liquid interaction for determining surface energy and stress. As compared with other wetting methods, this one offers the advantage that the final formulas involve no quantities difficult to determine. The parameters of the liquid are assumed to be all known. Surface energies, $\gamma$, and wetting angle, $\theta$, are related by $\Delta h = \gamma_{12} = \frac{1}{\cos \theta} - \tan \theta$ where $\gamma_{12}$ is a function of the potential energy of molecular interaction; the subscripts 1 and 2 refer to solid and liquid, respectively. When $\gamma_{12}$ is calculated Card 1/2

**TEXT:**

Determination of the total surface energy and expressed in terms of $\theta$ and $x = \left(\frac{v_2}{v_1}\right)^{1/3}$ this leads to the final relation

$$x = \frac{\gamma_{12} \max}{\sqrt{1 + \left(\frac{1}{2} + \frac{1}{2} \frac{1}{\cos \theta} - \tan \theta\right)^2 \left(2 + \frac{1}{\cos \theta} - \tan \theta\right)^{1/3}}} - 1 \right].$$

(13)

the $v_1$ are the specific volumes. Surface energy and surface stress are computed for solid benzene and for sulfur wetted with benzene, CCl$_4$, toluene, and cyclohexane. The values agree well with each other. The surface stress for NaCl is found to be 237 dyne/cm. There is 1 table.