A NOVEL SURFACE RHEOLOGICAL METHOD FOR FORMULATION DEVELOPMENT

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A method of measuring interfacial and surface film formation of water soluble macromolecules has been described (Sherriff and Warburton 1974; Sherriff et al 1975). The original equipment was analogue in nature but has been succeeded by a digital instrument utilising a dedicated microcomputer.To date, this technique has only been applied to biological liquids (Kerr and Warburton, 1985) and paint technology, but it is equally useful in the field of pharmaceutical formulation.

The new apparatus still retains a planar platinum ring (Fig. 1) as in the original design, but the new galvanometer assembly uses a ligature suspension, thus improving the sensitivity and reliability of the surface viscosity measurements, The ring is made to oscillate in the interface with a small angular amplitude, the torque and displacement data is digitised and analysed in real time by a two stage microprocessor to obtain surface shear elasticity and surface shear viscosity results.

To illustrate the use of the new equipment the results for the surface shear elasticity of various B-cyclodextrin solution films are given in Fig 2.

From the results it can be seen that B-cyclodextrin solutions of concentration greater than 0.7% form solid films, those below 0.7% appear to form only viscous films in the time over which they were measured. Interfacial film formation with polysaccharides is well documented, however that with smaller molecular weight oligosaccharides is not. This equipment, in being able to measure the elasticity and viscosity of many films, enables many substances previously not thought to be surface active to be re-examined in a new way. The digitising of the equipment and new ring assembly allows for far greater sensitivities to be achieved and hence weaker films to be characterised. One further advantage of the equipment is that the sample size need only be of the order of millilitres so expensive chemicals such as biochemicals can be more readily investigated.

FIGURE 1

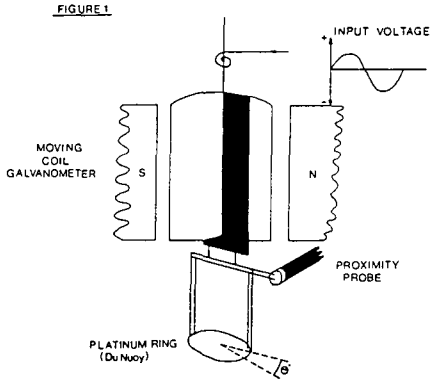
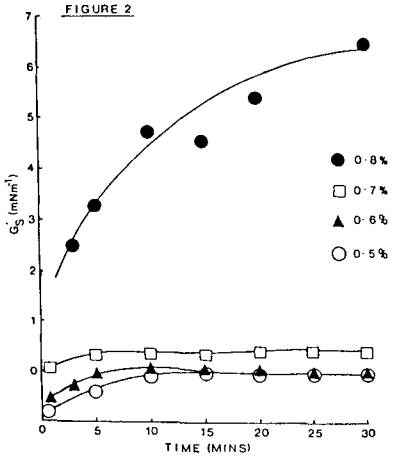


FIGURE 2



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