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DEVELOPMENT OF A NOVEL SPINNING DISC DEPOSITION SYSTEM

R.Y. Nigo, D.I. Wilson* & W.R. Paterson

Department of Chemical Engineering, University of Cambridge, Pembroke St, Cambridge, CB2 3RA, UK

ABSTRACT

Fats and oils form an important part of the dietary group and are widely used in food manufacture. At room temperature, fats are usually solid while oils are liquid. Handling and transportation of liquid triglyceride mixtures in a piping network under factory conditions can be problematic due to deposition or 'coring'. Deposition or fouling occurs via crystallisation, when the temperature of the solution is reduced below its cloud point.

In experimental studies aimed at understanding the behaviour of such systems, there is a need for well defined flow and temperature conditions. A novel spinning disc deposition unit has been developed for this study. The rig comprises a variable speed cylinder fitted with a deposition surface positioned in a thermostatted holding vessel. A heating/cooling system based on recirculating water through the spinning cylinder allows the device to be used for cold and hot surface studies.

Model solutions of tri-palmitin (PPP) in an inert solvent, liquid paraffin, were used as model fats in this study. The thermal and rheological behaviour of these solutions have been characterised using DSC (for phase changes) and controlled stress rheometry (gel formation) and are linked to observed deposition behaviour.