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SIMPLE MODELS FOR CLEANING: 1: COHESIVE AND ADHESIVE REMOVAL IN THE CLEANING OF MODEL FOOD DEPOSITS

W. Liu, Z. Zhang & P.J. Fryer

Centre for Formulation Engineering, Chemical Engineering, University of Birmingham

ABSTRACT

Micromanipulation probes allow direct measurement of the forces involved in the removal of deposits from surfaces. Here we have used the probes at different heights above the metal surface, to study the ways in which the deposit fails and is removed.

Two types of removal mode are seen for tomato deposits:

- (i) fracture of the deposit down to the surface followed by sliding over the surface, and
- (ii) removal of a uniform layer.

Mode (i) is seen at low cut height, whilst mode (ii) is seen at high cut height. The work required to remove the deposit *increases* with cut height in mode (i) and *decreases* with increasing cut height in mode (ii).

The form of the behaviour can be modelled. Mode (i) is modelled in terms of deposit fracture across the surface, where the model is similar to that for the fracture of gels from a surface. Mode (ii) can be modelled assuming that the deposit has some yield stress, followed by the effect of surface shear as it is removed. The two modes can be related to the cleaning of real equipment.