ABSTRACT

The Flow Kinetics and Uses of Immobilized Papain and Solar-dried Papaya Latex

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CHAPTER ONE gives a review of papain in general — solar drying principles, immobilization techniques, kinetics and applications, the use of papain in meat tenderizers and in the prevention of chill-haze in beer.

CHAPTER TWO describes the details relating to the experimental aspects of the solar-drying of papaya latex and the determination of its proteolytic activity. It has been found that the time taken for fresh latex to dry from an initial moisture content of between 73-80% (wet basis) to an equilibrium moisture content of between 6-8% varied from about 1.5 to 36 hours depending on the charge size. The proteolytic activities of the fresh and dried latex were found to be similar.

Two types of immobilized papain reactor systems, the packed-bed and open tubular heterogeneous

systems, are described in CHAPTERS THREE and FOUR and explanations are offered for changes in the kinetics upon immobilization. The kinetic data was treated according to the theories of Lilly, Hornby and Crook and Kobayashi and Laidler as outlined in CHAPTER ONE.

CHAPTERS FIVE and SIX deal with the applications of immobilized and solar-dried papain, respectively. The results in CHAPTER FIVE show that beer can be effectively chillproofed after 4 hours contact time with the Fractogel-papain reactor. In CHAPTER SIX, results are presented on the chemical, physical and sensory evaluation tests conducted on Buffalypso meat treated with varying amounts of solar-dried papain. A high correlation was observed among these analytical tests and it was found that between 0.001 - 0.01% papain solution was considered to be an acceptable level in the tenderization of Buffalypso meat.

In CHAPTER SEVEN are presented the main conclusions that resulted from the various tests conducted on solar-dried latex and immobilized papain.