

Chapter 1

Introduction

Although there are many simple methods widely used for particle classification, they may not be suitable, in some special cases such as ground mixture of ocimum seeds (seeds of *Ocimum americanum* L.). This mixture obtained by grinding ocimum seeds consisting of fractions of seed coat and its core. Removal of fine particles fraction from this mixture is one step in the production procedure of bulk laxative drug. Seed coat fraction is highly swellable in water and behaves as a good suspending agent. Seed cores, after having been ground, are extremely fine particles smaller than 40 μm in size which is about 16 % in the mixture. In addition, Rojanapanthu *et al* (1,2) reported that swellable substance found in seed coat also contained high moisture content of about 10 %, and 1 % of this swelling substance in water yielded a viscosity of 12,900 cps .

Separation by wet method are unfortunately limited by the swelling properties of seed coat if some trace amount of water appears in the liquid used and the mechanism of separation is consequently inhibited. Moreover, some organic solvents or liquids not only create a serious pollution problems to environment, but also lead to an increase in production cost. Even though sieve screening method may be used to classify this mixture, preliminary study in laboratory scale has shown that fine particles tended to adhere and accumulate on the sieve openings which in turn agglomerated with seed coat particles. This phenomena might be due to its considerably high moisture content which lead to an increase in operating time as well as reduction of

efficiency. However, separation time might be reduced by drying of mixture before sieving.

According to the fluidization phenomena, application for particles separation by this process could be performed. However, for economic reasons (i.e., construction, power requirements for supplied of fluidizing gas, etc.), it is doubtful except in special cases (3). For example, there are some commercial combination drying and sizing fluid-bed installations for handling limestone, dolomite, and iron ores are in operation, demonstrated that this method is practical and economical to make sizing separations between 150 and 600 μm in a combination drying and sizing unit (4)

Considering the general properties of ocimum seed ground mixture, sizing along with drying may be possibly done by fluidization technique. Preliminary study on classifying of this mixture by fluidized bed in laboratory scale was performed, and the results have shown that efficiency fell in the acceptable range. However, some problems was encountered in the design of fluidized-bed for above purpose since it is not a widely used method and very little informations are available. There are lacks of some essential information concerning the mixture, such as particle size distribution, density, mixture composition, etc., which is of value to this method.

The main purpose of this investigation is to study the classification phenomena of ocimum seed ground mixture by mean of elutriation from fluidized bed. The obtained experimental results will be subsequently employed in the operation of combined classifying and drying equipment.