PREFACE

This problem of the 'Fall of Liquid Drops in Water' is taken up for investigation in the Department of Chemical Engineering, Indian Institute of Technology, Kharagpur in January 1954. The results accrued to-date are incorporated in this first thesis.

A survey of the literature on the dynamics of rigid and fluid particles is given in Chapter I. Recent references in subjects related to the problem are included as far as possible for the use of subsequent workers in these laboratories.

The test column constructed and the techniques used or developed for the determination of physical properties of liquids, terminal velocities, sizes and shapes and wall effect of liquid drops are given in Chapter II.

In Chapter III are given the plots and discussion of the terminal velocity data, photographic data and wall effect data. The effect of physical properties on terminal velocities of drops are shown by proper grouping of the thirty one drop liquid - water systems investigated.

Correlations for the data on drag coefficients, peak velocities, maximum drop sizes and wall effect are presented in Chapter III after giving the dimensional analysis of the problem and plots of the different dimensionless groups attempted.

A discussion of the factors causing the high drag coefficients of liquid drops and the analysis of true drag coefficients into those due to form and other causes are given in Chapter V. A statistical approach for the determination of the limits of variation in the length of the drop is also presented in this chapter.

The Appendices include the terminal velocity data, photographic data, tables of dimensionless groups and details of certain aspects referred to in the chapters.

For ease of reference, the nomenclature and literature cited are given at the end of each chapter. The equations, tables, figures, plates and appendices are also numbered chapter-wise. Figures and plates are given at the ends of the chapters.

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