BOOK REVIEWS

Fluid Mixing

This small volume (A5 format, hard covers, approximately 210 pages) is a record of the papers presented at a symposium organised by the Yorkshire Branch and the Fluid Mixing Processes Group of the Institution of Chemical Engineers and held in Bradford in March 1981. The individual contributions vary greatly in length: from 8 to 33 pages. The papers are reproduced from the original typescripts submitted by the authors and are nevertheless very legible. The papers would be easier to follow if the figures were included in the text rather than placed at the end of each paper and I would have thought that the high price* of the volume could have been reduced by using paper binding.

Thirteen papers are included: one (in spite of the symposium title) is primarily concerned with the mixing of solids, the rest are all concerned with liquid mixing in agitated tanks. Most of the papers report primarily experimental work, although there is one entirely theoretical treatment and two more with considerable theoretical or modelling components. In all cases except one the tanks were agitated mechanically, the remaining study was concerned with jet agitation. The diameter of the tanks studied ranged from 0.2 m to over 3 m, although only three papers were concerned with diameters greater than 1 m. These relatively small scale studies are presumably a reflection of the fact that a large majority of the work reported was carried out in university laboratories. It is disappointing that such a symposium concerned with a very practical subject should attract only a relatively small industrial participation.

The liquids studied were both Newtonian (for example water and dilute electrolyte solutions) and non-Newtonian (for example molten chocolate and Carbopol solutions), and a wide range of impeller geometries are represented. The variables measured were (in descending order of popularity) power requirement, flow pattern, heat transfer coefficient, and time to achieve mixing. These facts make objective comparison of the work difficult; mixing is a highly empirical subject and the work reported here illustrates this well. The most interesting paper to me was that by Mann, Mavros and Middleton who measured the gas disengagement rate after a gas feed below the impeller was switched off. The resulting fall in liquid height in the tank was then used to infer the type of mixing and the flow patterns present in the stirred liquid.

This book, as can be seen, will be primarily of interest to those engaged on research in liquid mixing, and of comparatively little interest to industrial designers.

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Process Level Instrumentation and Control: Vol 2

Engineering measurements and instrumentation.

N. P. Cheremisinoff

The book is aimed at practising engineers in the process industry and at senior-to-graduate students of engineering. It will be useful to those engineers who do not specialise in control or instrument engineering but who need a technical reference when assessing the merits of a given level measurement system.

Most of the types of level instrument in commercial use are included. The first two chapters are devoted to a brief review of the mathematical principles of automatic control, with emphasis on level control, and of design practices including references to vessel dynamics and to the importance of safety considerations. The operating principles of each type of level instrument are described in the ensuing chapters, each case backed-up by a general description of a discreetly-named commercial example and by typical industrial applications. A chapter on control valve characteristics and an Appendix on Laplace Transformations conclude the book.

The theoretical treatment should be well within the grasp of the intended readership and there is a wealth of detail devoted to practical aspects. It is therefore almost surprising that there is no explicit reminder of the discrepancy between the true level in a boiler and that 'seen' in a gauge glass connected to it. This topic could also be complemented by a mention, in the chapter on newer devices, of the 'Hydrastep' system developed by the CEGB for accurate indication of the level in a high pressure boiler.