Book review


Raj Chhabra has written an excellent book on a subject in which he himself is a world-class expert. Of course no book is perfect, and certainly should not be judged on its first sentence, for in his Chhabra assures us that “For the past 300 years or so, all of us have been accustomed to accept the simple Newtonian fluid model as the standard fluid behaviour”—some of us are not so old Raj! However, we can quickly move past this faux pas, to get onto the real strength of the book which is a thorough survey of single particles and clouds of particles moving through all sorts of liquids under the force of gravity, or conversely the flow of such liquids through clouds and beds of particles.

The book opens with an adequate introduction of the flow of non-Newtonian liquids, and the flow of spheres through them—these obviously form the starting point for such a book. Chhabra then takes us onto the flow of single spheres through almost every non-Newtonian liquid you could think of, along the way covering wall effects, viscoelasticity, through to some consideration of nonspherical particles. Then deformable particles are covered—bubbles and drops, and the same ground covered as for solid particles, with the added complication of slip at the particle interfaces and particle deformability.

A very useful chapter follows on flow through porous media and packed beds, then onto a good discussion of fluidisation and sedimentation. The book finishes with a consideration of heat- and mass-transfer issues and falling-ball viscometry.

The text makes excellent use of extended tables that summarise the work in particular areas with a set of succinct and useful comments. These provide an easy-to-read summary, rather then having to plough through dense paragraphs of material. The book is obviously written by a chemical engineer—none the worse for that of course—and takes the usual practical approach that we would then expect, with no superfluous use of mathematics, and a good exploitation of the relevant non-dimensional parameters. The diagrams are excellently drawn and well explained, and the references are full—the book gives over 1200—with each chapter separately referenced, along with the nomenclature and symbols used therein.

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One shock however is the price of the book: £171! As most people realise, the pricing of a book has little or nothing to do with the author, being the commercial decision of the publishers. In this case, even $171—i.e. being an American book—would have been a little excessive. I hope the price will not prevent this admirable book being a best seller.

The book is a worthy successor to Clift, Grace and Weber's *Bubbles, Drops, and Particles*, 1978, Academic Press. For the inevitable second addition, could the reviewer recommend that some reference is made to particle interactions, so that clusters of particles and the sedimentation of flocculated systems be given some coverage?

Chhabra promised "a reference text for research workers by the way of presenting a comprehensive critical evaluation of the voluminous literature available" and the "useful design information often required...in day-to-day routine calculations". He has kept his promise, and has given us an excellent standard reference in the area—buy it if you can afford it!

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