

## Remarks on adsorption manuscripts revised and declined: An editorial<sup>☆</sup>

A preliminary survey of the publication record of Separation and Purification Technology shows that for the past 2 years (calendar years 2005 and 2006), we have published, excluding those appearing in two special issues, a total of 413 articles comprising 3197 pages among which 109 articles with a total of 839 pages were concerned with adsorption and related sorptive fields including ion exchange, chromatographic separation, and sorbent synthesis and preparation. This relatively concentrated presence of adsorption articles (approximately 26% either in article numbers or printed pages) is a confirmation of the importance of adsorption as a subject of study and its relevancy to industrial technology. It also indicates a high level of present adsorption research activities worldwide.

All of us who are involved with the study of adsorption and the development and application of adsorption technology may be pleased with and take pride in this robust state of affairs attested by the publication record. However, a somewhat less promising issue may be concealed by these optimistic statistics. With this large number of published articles, we, as editors, have also seen an even greater number of adsorption manuscripts being found unacceptable. While declining manuscripts is unpleasant but necessary and unavoidable for any peer-reviewed archival publications, what is perplexing, in this case, is the very high proportion of these rejected manuscripts being confined mostly to adsorption of metal ion and other hazardous substances from aqueous solutions using sorbents of various kinds including those prepared from industrial by-products and agricultural waste.

Another common feature of these declined manuscripts is their remarkable similarity in organization and presentation. After reading a number of them, one had the impression that these manuscripts seemed to be prepared through assembly lines with a common organization pattern and using the same experimental methods and nearly identical procedures for data correlation and interpretation. Some of their common deficiencies may be summarized as:

1. Simple well-known methods were applied for adsorbent preparation. The preparation conditions were often described as being optimum. However, no evidence was offered to justify their claims. In certain cases, standard tests of sorbent characterization were made. But no attempts were made to relate these characterization results with sorbent performance.
2. Metal ion adsorption is well known to be pH dependent. However, the pH effect was invariably examined only in terms of the initial pH of the aqueous solution used in experiments. Not in a single case have we seen data demonstrating the changes of the solution pH during the course of an adsorption experiment.
3. For dye adsorption, the fact that commercial dyes are often mixtures of active ingredient and filler materials is often not recognized. The possibility that the experiments one conducts may be bi-solute adsorption was not considered.
4. The equilibrium data reported, without exception, were empirically correlated with conventional isotherm expressions (Freundlich, Langmuir and a few others) using the initial solution pH as a parameter, which totally ignored the obvious that equilibrium data depend upon the equilibrium condition and not the initial state. In a few cases, the authors did propose mechanisms of sorption. However, the proposed mechanisms were hardly used in interpreting equilibrium data obtained.
5. For batch adsorption experiments conducted, the adsorbate concentration history was determined. The change of the solution pH during the course of adsorption was never recorded. The kinetic data were inevitably fitted with the century-old Lagergren equation (or its variant). How this equation and the parameter values obtained can be used in design calculations of fixed-bed operation was ignored.
6. It seems that authors of these manuscripts were not conversant with some of the important adsorption publications of the past 50 years. None of them attempted to apply the well-developed surface ionization/complexation model or the double layer retention model to examine the pH or the ionic strength effect on the extent or rate of adsorption. Similarly, the authors appear to be unaware that the Lagergren equation may be viewed as equivalent to the classical

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Vermeulen–Hiestes approach of describing sorption rate by a series of resistances due to external mass transfer, intraparticle diffusion and chemical reaction. As a result, the Lagergren equation and its rate parameter lack clear cut significance since the parameter may be either a rate constant, mass transfer coefficient or their combinations. The “good data fit” has no real significance.

In our communications to authors about declining their manuscripts, we have always attempted to convey to them the rationale of our decisions as completely as possible. In view of the rather large number of this kind of manuscripts we have received and declined, it may be useful to offer our remarks in a more public forum. This is one reason for this editorial.

That so many deficient manuscripts on a given subject were prepared, processed and rejected is obviously a misuse of time and resources for the authors as well as us. The numbers of the manuscripts involved may also suggest that what we have experienced is not a local phenomenon and the problem may extend to other journals as well. While we have no doubt that most scientific publications have rigorous and strict peer-review procedures in place, we also realize that no review system is completely fail-safe especially when so many manuscripts were involved. In fact, as a recent review article published elsewhere shows that during the past two decades, sufficiently large numbers of articles similar to those we declined have indeed appeared in print. The situation, to put it bluntly, leads us to believe that a commu-

nity of adsorption investigators with insufficient qualifications is present among us.

The viability of any discipline depends largely on the quality of its investigators and the work they produce. The fact that within the adsorption community, there exists many individuals engaged in adsorption studies but without adequate preparations must be a concern to all members of the adsorption community. Considering its nature, this is a problem which cannot be resolved by a few individuals. What one can do is to make the problem better known to the public. This is another reason for writing this editorial.

Finally, let me emphasize that this editorial is not intended to discourage people from carrying out adsorption studies and submitting their results to us for publication. To the contrary, because of its intrinsic value and practical importance, metal ion adsorption and similar topics are topics of investigation of immense importance. We do indeed welcome and look forward to receiving well-prepared manuscripts on these subjects from all quarters.

Chi Tien\*

*Syracuse University, Department of Chemical Engineering  
and Materials Science, 320 Hinds Hall, Syracuse,  
NY 13244-1190, United States*

\*Tel.: +1 315 4434050/3351; fax: +1 315 4431243.  
*E-mail address: [ctien@mailbox.syr.edu](mailto:ctien@mailbox.syr.edu)*

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