would not understand what I was asking for and would go back to the conventional method of grinding out all the calculations, probably running out of time with less than half of the test completed.

AFTERWORD

When large numbers of students fail the stoichiometry course, our unstated presumption is that none of them are qualified to be chemical engineers and we are serving society by weeding them out. I question this presumption. Since the course is conceptually not all that difficult, we should at least entertain the possibility that many are not learning the material because we are not teaching it well.

We can stoutly assert (as some will when they read this article) that by the time our students get to us they "are supposed to be adults," that we should not have to "hold their hands" or "spoon-feed them"— and when their test averages are in the 40s and many of them fail and/or drop out, we can grumble about how they are unmotivated, apathetic, incompetent in mathematics, and so on. All of that may or may not be true, but it misses the point. We have to play with the hand we are dealt: the next generation of engineers will have to come from this group of students, whether we like it (and them) or not. If the teaching method used at universities for the past nine hundred years (wherein the professor speaks and the students sit at his feet and absorb wisdom) is ineffective, then we need to find better methods. This paper suggests an approach that has been found effective in the context of one chemical engineering course. It may not solve the problem, but it could be a start.

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ChE *letter to the editor*

THE MISSING LINK

Editor:

It was with some interest that I read the article "A Laboratory Experiment on Combined Mass Transfer and Kinetics," by S. A. Sanders and J. Sommerfeld. I would like to offer the following comments:

1. I searched for a mass transfer link, like k_L or D_A for example and it was in vain. Does not a "film" transfer disguise the overall kinetics? If it did not, where else does mass transfer interfere to justify the title?

2. For the aspect ratio to remain constant, $(h/r)_t$ should equal (H/R). This condition holds for a very special initial geometry where H = R and approximate spherical symmetry for later times would ensure that (h/r) equals unity. If H R, a rough analysis would show that

$$-\frac{\partial h}{\partial t} \propto r^2 \qquad \text{and} \qquad -\frac{\partial r}{\partial t} \propto h.r$$

The proportionality constant is $\phi = \phi\,(k_1, k_L; \Delta C)$ where k_1 is the intrinsic heterogeneous rate constant, k_L the external mass transfer coefficient, and ΔC the concentration driving force.

So that
$$\left.\frac{dh}{dr}\right|_t \propto \frac{r}{h}$$

Therefore it is the function
$$f(r,h) = \sqrt{\frac{1-(r/R)^2}{1-(h/H)^2}}$$

that equals H/R, when R = H, α remains constant at unity.

3. Experiments could have been interrupted and aspect ratio shown to be constant or variable at various t. A tumbling soft pellet like the antacid tablet is hardly expected to maintain sharp corners. It might even disintegrate like "disprin," probably it does in the stomach.

4. Tablets are often porous and the rate equation proposed (Eq. 3) may not be valid even in the absence of external diffusion resistance.

Sincerely,

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