

65%. This, combined with a cooling-water return temperature of 51°C, *i.e.*, 6°C above the suggested maximum, will lead to severe tube-side problems if extended operation is undertaken in this mode. It is perhaps worth observing that a reduction in cooling-water velocity from 1.5 to 1.0 m/s defines the practical turndown of a condenser, and this is broadly in agreement with the limit of energy-efficient turndowns as discussed in A above.

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Author's Response

Dear Sirs:

I thank Professor Jones for his interest in the problem titled "Distillation Column Performance." His observations regarding tray performance and condenser operation are correct, and the assumptions made in this regard should have been clearly stated.

When this problem is assigned to students, the purpose is to demonstrate the interrelationship between a distillation column and the required heat exchangers. The problem, as presented, demonstrates that neither can be analyzed in iso-

lation from the other.

Professor Jones' observations suggest an extension of this distillation column performance problem, illustrating the richness of open-ended problems. After solving the distillation problem as in the paper, the problem with tray performance and condenser operation could be pointed out to students. They would then be asked to suggest alternatives for compensating for tray performance and condenser operation limitations.

Numerous alternatives exist, and the new assignment would be an excellent creativity exercise. One alternative is to replace equipment. Valve trays and small-diameter condenser tubes could be installed. Another alternative is to maintain the original boil-up rate from the reboiler, or just increase the boil-up rate from the scaled-down value enough for the trays and condenser to operate correctly. This option also requires an increased reflux ratio, which should result in a better separation. If a better separation were not desired, the feed location could be moved, equipment permitting, to reduce the separation.

Consideration of these two alternatives might lead to a discussion of the economics of replacing equipment versus changing operating conditions.

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ChE stirred pots

To the Editor:

A while ago I downloaded from the Internet a program called Karma Manager, which makes anagrams of any word or phrase you input. It determines all possible sets of words that can be made by rearranging the letters of whatever you type in (ignoring spaces), and it returns each set to you in a list. After typing in a few names and finding little (six entries for my name, the most interesting being "kava kid of Ed"), I entered "thermodynamics" and observed over 10,000 anagrams emerge! Karma Manager merely presents the sets of words, without ordering them in a way that might make sense. I didn't have enough free time to look at them all, but here are some of the interesting ones I found.

dim men try chaos	some rancid myth	had my nice storm
consider my math	mystic harm done	sad men cry to him
charm in modesty	them micron days	scorn media myth
my romantic shed	dim men crash toy	scare my hot mind
its my amen chord	I deny most charm	macho men sit dry
my sham doctrine	some thin mad cry	most handy crime
my hindmost care	Oh stem racy mind	not my cider mash
hamster in my cod	short icy madmen	shy men or dim cat
shy dormant mice	my son came third	me and my ostrich

Karma Manager (which itself is an anagram) can be obtained by going to the Web site <http://www.shareware.com> and searching on "Karma."

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