Table 1 Peak compression of PMPA on addition of n-butanol *

Vol.% n-butanol	Capacity factor (k')	Efficiency (N)
0	3.3	500
5	0.5	10,000
9	0.3	20,000

* System: column, 150 mm x 0.32 mm i.d. PRP-1; eluent, 20 vol.% methanol / 3% ammonium formate in water.

observed. For n-butanol concentrations exceeding 5% the plate number reached a plateau of 45,000 as against 400 in the absence of the alcohol. The capacity factor of IMPA decreased from $k' = 2.4$ to $k' = 0.5$.

Because the retention of n-butanol also depends on the LC eluent composition, in a subsequent experiment 20 vol.% of methanol were added to the 3% ammonium formate in water solution used as LC eluent. **Figure 4** shows results for four organophosphorus analytes in the absence and presence of n-butanol. Peak compression clearly occurs, the peak height increasing *ca.* 3-fold and 5-fold for peaks no. 3 and no. 4, respectively. Apart from showing the potential of peak compression, the present example also shows its limitations: the relatively minor shift of the EMPA peak (no.2) destroys the marginal resolution from the impurity moving in front of it in the absence of n-butanol. Finally, as is to be expected, the position of peak no.1 with its virtual absence of retention, is not affected by the n-butanol-induced displacement.

In order to study peak compression for a more hydrophobic analyte, *viz.* one containing a pinacolyl [$(CH_3)_3CCH(CH_3)O$] grouping, such as PMPA, the PRP-X100 column was replaced by a 150 mm x 0.32 mm i.d. PRP-1 column. The eluent conditions were the same as in the previous example. The peak compression effected by the addition of n-butanol is illustrated by the set of data shown in **Table 1**. This result is especially rewarding, because PMPA is the hydrolysis product of the super-lethal nerve agent soman. Its low-level determination is therefore distinctly useful.