amount of phospholipid would have yielded less phosphoethanolamine than actually isolated. On the other hand after extraction of lipids in the bacteria the remaining fraction of nucleic acids and protein still contained about 3 % of fatty acids. By the subsequent extraction of nucleic acids with hot 5 % trichloroacetic acid a cephalin-protein compound may have been hydrolyzed giving a part of the phosphoethanolamine bound to the protein part. At present time it is not possible to decide whether the compound is a constituent of a phosphoprotein or represents a link in a lipoprotein complex. In this connection it must be reminded about the fact that *E. coli* as a Gramnegative bacterium contains more phospholipids than a Grampositive microorganism as *L. casei* [9,10]. However, phosphoethanolamine cannot only be isolated from the rest proteins of the walls but also from water soluble fractions of proteins obtained after centrifugation at 105 000 *g* for 30 min at 0°C and precipitation with ethanol or acetone [5].

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1. Ågren, G., de Verdier, C.-H. and Glomset, J. *Acta Chem. Scand.* **8** (1954) 1570.
2. Ågren, G., de Verdier, C.-H. and Glomset, J. *Acta Chem. Scand.* **9** (1955) 1041.
3. Engström, L. and Ågren, G. *Acta Chem. Scand.* **10** (1956) 877.
4. Ågren, G., de Verdier, C.-H. and Glomset, J. *Rev. fermentations et inds. aliment.* **11** (1956) 234.
5. Ågren, G. *Acta Chem. Scand.* **10** (1956) 152.
6. Smith, L. C. and Rossi, F. M. *Proc. Soc. Exptl. Biol. Med.* **78** (1954) 643.
7. Ikawa, M., Koepfli, J. B., Madd, S. G. and Niemann, C. *J. Am. Chem. Soc.* **75** (1953) 3439.
8. Baer, E., Marukas, J. and Clarke, D. *J. Biol. Chem.* **228** (1957) 181.
9. Work, E. *Nature* **179** (1957) 841.
10. Mitchell, P. and Moyle, J. *J. Gen. Microbiol.* **10** (1954) 533.

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Note on the Mutual Solubility of Molybdenum Trioxide and Wolfram Trioxide

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Previous studies on the molybdenum trioxide-wolfram trioxide system have shown that the mutual solubility of these two substances, if there is any at all, is very low [1] (experiments performed at room temperature using samples prepared at 700°C). Access to a Guinier focusing camera with strictly monochromatized $CuK\alpha_1$ radiation has made possible a quantitative estimation of the limits of solubility.

The samples studied were prepared by prolonged heating of intimate mixtures of the two trioxides (both of reagent grade) in sealed, evacuated silica tubes at 700°C. Precautions as described elsewhere [2] were taken to ensure a constant temperature during the annealing time (two periods, of about one week each with intervenient regrinding of the specimen). The samples were quenched in water from the heating temperature. Potassium chloride (Analar, British Drug Houses, $a = 6.2919$ Å at 20°C [3]) was added to the powder specimens as an internal standard [4].

For wolfram trioxide the following unit cell dimensions were obtained:

$a = 7.306 \pm 0.001$ Å, $b = 7.541 \pm 0.001$ Å,
$c = 3.845 \pm 0.001$ Å, $\beta = 90.85° \pm 0.05°$.

The axial lengths exceed by about 0.3 % those derived previously from photographs taken without an internal standard [5,6]. The axial ratios and monoclinic angles obtained from the two experiments are, however, in fair agreement.

Addition of molybdenum trioxide caused slight, continuous modifications of the wolfram trioxide powder pattern up to the approximate composition $W_{0.96}Mo_{0.04}O_3$, which evidently represents the limit of solubility under the conditions mentioned above. These changes are exclusively attributable to a decrease of the length of the a axis, which for the latter composition was found to reach the limiting value of 7.301 ± 0.001 Å, while the other unit cell dimensions were not perceptibly altered.

For pure molybdenum trioxide, unit cell dimensions were obtained in fair agreement with previous data [6], *viz.*

$a = 3.9628 \pm 0.0007$ Å $b = 13.855 \pm 0.003$ Å
$c = 3.6964 \pm 0.0006$ Å

The powder patterns of molybdenum trioxide samples containing minor additions of wolfram trioxide gave lattice parameters slightly different from those of pure molybdenum trioxide. Thus the a axis was found to decrease to a limiting value of 3.9590 ± 0.0006 Å at the approximate composition $Mo_{0.96}W_{0.04}O_3$ while the b and c axes reached maximum lengths of 13.862 ± 0.003 Å and 3.6989 ± 0.0007 Å, respectively, at the composition $Mo_{0.98}W_{0.02}O_3$. The results might possibly indicate a considerable deviation from linearity of the parameter changes associated with the substitution of wolfram for molybdenum atoms in the molybdenum trioxide structure. The experimental evidence, however, scarcely allows such a conclusion to be made with any degree of confidence. The limit of solubility may thus only be roughly estimated to be about 3 mole % of wolfram trioxide.

The intermediary range of composition of the system was not studied in any detail. It seems likely, however, that the phase relations in this region [1] are somewhat more complicated than assumed previously.

The low mutual solubility in this system is another instance of the marked difference in crystal-chemical behaviour often shown by molybdenum and wolfram [7]. The variations of the unit cell dimensions associated with the solubility indicate that the metal-oxygen octahedra change towards a more regular shape with inrceasing wolfram content. This is also in accordance with previous observations [2,7].

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1. Magnéli, A. *Acta Chem. Scand.* **3** (1949) 88.
2. Magnéli, A., Blomberg-Hansson, B., Kihlborg, L. and Sundkvist, G. *Acta Chem. Scand.* **9** (1955) 1382.
3. Hambling, P. G. *Acta Cryst.* **6** (1953) 98.
4. Westman, S. and Magnéli, A. *Acta Chem. Scand.* **11** (1957) 1587.
5. Andersson, G. *Acta Chem. Scand.* **7** (1953) 154.
6. Magnéli, A., Andersson, G., Blomberg, B. and Kihlborg, L. *Anal. Chem.* **24** (1952) 1998.
7. Magnéli, A. *J. Inorg. & Nuclear Chem.* **2** (1956) 330.

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A Cytidylic Acid — Peptide Complex from *Polyporus squamosus*

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During the past ten years a variety of ribonucleotides has been isolated and identified from various natural sources. These substances are all nucleoside-5′-mono- or polyphosphates with the exception of triphosphopyridine nucleotide which contains a nucleoside-2′-phosphate moiety and the 2′- and 3′-phosphates obtained by chemical or enzymic hydrolysis of nucleic acids. A recent report has revealed the presence of a new guanosine-3′-phosphate derivative in alcoholic extract of brewer's yeast [1]. In the course of a study of the acid-soluble nucleotides of *Polyporus squamosus* we have isolated one hitherto unknown cytosine nucleotide (CMPX). It is the purpose of this report to present the experimental data about this substance. CMPX appears to be a nucleotide-peptide complex with one phosphate group in the 2′- or 3′-position of the ribose moiety.

The isolation and quantitative analysis of the acid-soluble nucleotides of *P. squamosus* was accomplished using the method described in an earlier paper [2]. The nucleotides were isolated by extraction with cold perchloric acid and, after removal of interfering substances, the solution was applied to a Dowex 1 (formate form) column. The elution of the substances was performed with increasing concentrations of formic acid or a mixture of formic acid and sodium formate. Among the different components eluted from the column, which will be presented in detail later, we obtained the CMPX peak after adenosine-5′-phosphate by elution with 0.1 M formic acid. The quantity of the nucleotide was about 10 μmoles per 1 000 g of