complexes catalyse the addition of phosphine to formaldehyde, Equation (ii), below:

$$PH_3 + 3CH_2O \longrightarrow P(CH_2OH)_3 \qquad \text{(ii)}$$

This reaction is quantitative and is the best synthesis of thmp. However, the need to use phosphine to make thmp may deter some chemists but there is an alternative route from $[P(CH_2OH)_4]Cl$; the method and research quantities of this phosphonium salt are available from Albright and Wilson*.

Summary

Tris(hydroxymethyl)phosphine has the following combination of desirable properties:

- white, crystalline, water soluble trialkylphosphine
- easily handled, can be weighed in air
- forms water soluble metal complexes
- small cone angle, between those of trimethylphosphine and triethylphosphine
- readily prepared.

From our work it is clear that unique metal-phosphine chemistry takes place in water when using tris(hydroxymethyl)phosphine (4). Thus its co-ordination chemistry will be worthy of further study, particularly in areas where water solubility would be an advantageous property, such as homogeneous catalysis, noble metal drug development, metal imaging agents and metal extraction.

Acknowledgements

We thank Albright and Wilson for supporting this work, and Johnson Matthey for the loan of platinum metal salts.

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Materials for Higher Density Recording

Last year a short item was published in this journal to draw attention to two papers from scientists at the Philips Research Laboratories, in the Netherlands, and at the E. I. du Pont de Nemours Experimental Station, U.S.A., both of which reported investigations into the magnetic and magneto-optic properties of cobalt/platinum layered structures (1) . In the same issue an abstract of a communication from the Sony Corporation Research Center, Yokohama, Japan, on the properties of ultrathin multilayer films was published (2). Now two further papers from these Japanese researchers have appeared (3, 4).

Amorphous rare-earth transition-metal films used as magneto-optical recording media are easily oxidised and an additional element is required to provide resistance to corrosion. For these reasons, and because the magneto-optical properties of currently used media decrease at the shorter wavelengths favoured for higher density recording, investigations to find superior materials are continuing. The recent paper describes the magneto-optical and magnetic properties of ultrathin cobalt/platinum and cobalt/palladium multilayers.

The structure of these multilayered films, their magneto-optical and magnetic properties and the dependence of these on film thickness are reported and discussed, as is the dependence of the magneto-optical properties on light wavelength. Corrosion resistance of these multilayers is high and they are thermally stable at temperatures of up to 400°C.

It is reported that at 780 nm the magneto-optical properties of ultrathin cobalt/platinum films are superior to those of TbFeCo films, while at shorter wavelengths the figure of merit is even better, being 2.5 times larger than that of TbFeCo at 400 nm.

A further communication by the same authors, on the potentially useful magnetic properties of rf magnetron sputtered thin films of cobalt-palladium alloys, is abstracted on page 99 of this journal.

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