

polymerize and by the low rate at which such a polymerization would occur with the other additives at the concentration used and in such viscous media.

The additives, particularly triallyl cyanurate, seem to operate either by inhibiting chain scission in these polymers or by converting chain scission into a cross-linking reaction. It is possible that these additives may react with all the primary products of the action of ionizing radiation on the polymer. Examination of the effect of hydrolysis on the gel fraction of triallyl cyanurate cross-linked polymers may indicate the nature and extent of the interaction.

It is hoped to report the results of this investigation more fully at a later stage.

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Second Explosion Limit of Dried Carbon Monoxide-Oxygen Mixtures

THE position of the second explosion limit of carefully dried mixtures of carbon monoxide and oxygen in quartz vessels has been determined. Both the heating and withdrawal methods were used in a static system. Carbon monoxide was prepared from sodium formate and concentrated sulphuric acid, and oxygen by heating potassium permanganate. After being passed through chemical desiccants and then through cold traps, the gases underwent a final drying operation immediately before use. This final drying consisted in allowing the gases (sometimes premixed) to stand in 'Pyrex' drying vessels surrounded by liquid oxygen for at least 12 hr.

Explosion limits for carbon monoxide-oxygen (1:2) mixtures in the pressure-range 40-250 mm.

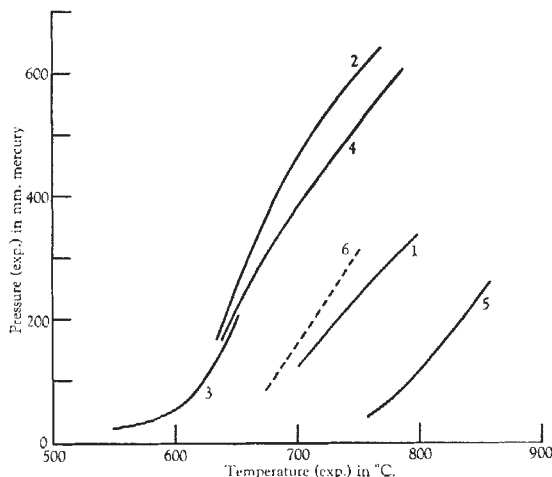


Fig. 1. Position of second explosion limit in the dry carbon monoxide-oxygen reaction (1) Knipe and Gordon (ref. 1), (20% CO); (2) Hadman, Thompson and Hinshelwood (ref. 2), (20% CO); (3) Hoare and Walsh (ref. 3), (20% O₂); (4) Lewis, von Elbe and Roth (ref. 4), (20% CO); (5) present work (20% CO); (6) present work with the final drying process omitted

mercury lay between the temperatures 750° and 840° C., and are shown in Fig. 1 together with the published results of other workers. It will be seen that the present results lie at considerably higher temperatures than so far reported. Experiments were also made using gas mixtures which had not undergone the final drying procedure mentioned above. The limits were found to lie at a temperature some 100° C. lower. Gordon and Knipe¹ have shown that small traces of water vapour lower considerably the limit temperature. We suggest, therefore, that the higher limits reported here can be attributed to the use of drier gases than those employed in earlier work.

A detailed report of this and related work, including an account of the effects of mixture composition and of added inert gases, will be published elsewhere.

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New Approach to the Synthesis of O-Phosphoserine and Related Peptides

A GENERAL method of synthesizing phosphorylated amino-hydroxy acids and derived peptides, using diphenylphosphorylchloridate as the phosphorylating agent, was introduced by Riley *et al.*¹ This method has been applied with rather satisfactory results in the synthesis of α -carbethoxy-L-lysyl-L-(O-phosphoryl)-serylglycine²; but further studies on the inhibitory spectrum of phosphoserine³ towards proteolytic enzymes, and the effect of phosphatases² upon various substrates as well, stress the necessity of alternate synthetic methods.

When diphenyl groups from O-diphenylphosphoryl peptide derivatives containing other than aliphatic side-chain amino-acids are removed by catalytic hydrogenation in the presence of platinum catalyst, the likelihood of reduction of the side-chain rings is apparent. In this connexion it is of interest to note that O-diphenylphosphoryl esters have been believed up to the present to resist hydrogenolysis in the presence of palladium catalyst. Based on this assumption, a stepwise removal of protecting groups from carbobenzoxy-D,L-(O-diphenylphosphoryl)serine benzyl ester has been recently reported⁴. This consists, first, in the removal of the carbobenzoxy and benzyl groups by hydrolysis in the presence of palladium and then of the phenyl groups using platinum catalyst. Thus, the intermediate product D,L-(O-diphenylphosphoryl)serine⁴ was described as a crystalline compound with melting point 129-130°.

Our experience, however, with hydrogenolysis of O-diphenylphosphoryl serine peptide derivatives in the presence of palladium has led us to a different conclusion. Special emphasis has been placed so far on the hydrolysis of carbobenzoxy-D,L-(O-diphenylphosphoryl)serine benzyl ester. When the latter was hydrogenated in the presence of a palladium catalyst and two equivalents of hydrogen were absorbed in about 1 hr., we were unable to isolate the reported product O-diphenylphosphoryl serine⁴.