

# ALIEN PROPERTY CUSTODIAN

## HEXAESTERS OF TETRAPHOSPHORIC ACID

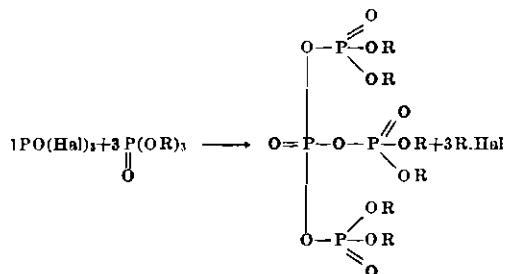
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This invention relates to the manufacture of hexaesters of tetraphosphoric acid.

Tetraphosphoric acid esters have hitherto not been known.

It has been made the surprising discovery that the hexaesters of tetraphosphoric acid can be easily prepared by causing phosphorous oxyhalogenides to react with neutral phosphoric acid esters, preferably at elevated temperature. The reaction scheme is as follows



R being an organic radical, 1 carbon atom of which is directly linked to the oxygen atom.

As neutral phosphoric acid esters above all the triethyl-, tributyl- and the tri-(chloroethyl)-phosphate respectively come into consideration which are technically used as softeners. Other suitable esters are, for instance, tripropyltrimethoxyethyl- or tricyclohexylphosphate respectively.

As phosphorous oxyhalogenides, for instance, phosphorous oxychloride or phosphorous oxybromide can be used.

For carrying out the reaction it is not necessary to use a solvent.

The reaction is suitably performed at temperatures between 130 and 150° C and proceeds nearly quantitatively.

The products according to the invention represent water-soluble oils which have a glycerine-like consistency. They may be used, for instance, as lubricants or softeners.

The following example illustrates the invention without, however, restricting it thereto:

### Example

182 gs of triethylphosphate are heated while stirring under reflux so that the temperature of the liquid is about 150° C. Within half an hour 53 gs (½ mol) of phosphorous oxychloride are added drop by drop. After the addition of phosphorous oxychloride the temperature is kept still half an hour at 150° C; hereupon the mixture is cooled. 164 gs of the tetraphosphoric acid hexaethylester are thus obtained. Yield: 96%.

In a similar manner the following substances may be prepared:

tetraphosphoric-acid-hexa-n-butylester  
tetraphosphoric-acid-β-chloroethylester  
tetraphosphoric-acid-hexa-n-dodecylester  
tetraphosphoric-acid-hexa-n-propylester  
tetraphosphoric-acid-β-methoxyethylester  
tetraphosphoric-acid-cyclohexylester.

All the last-named substances represent oils with glycerine-like consistency.

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