

Fluka Prize

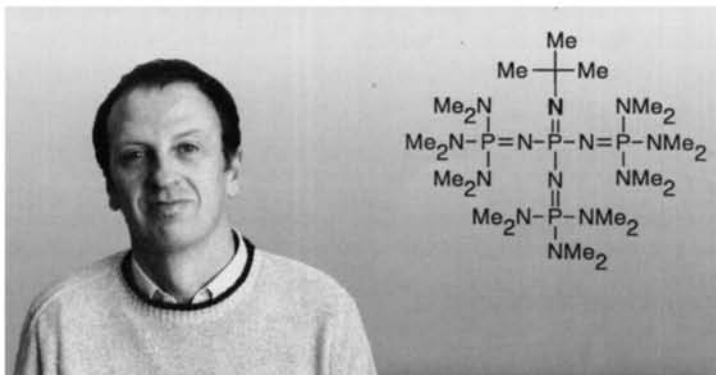
# Reagent of the Year 1992

79421 Phosphazene Base  $P_4$ -t-Bu, IM in hexane, purum  
package sizes 1 ml and 5 ml

The Prize Winner 1992:

R. Schwesinger, born 1947, studied at the University of Freiburg, Germany, where he obtained his PhD under the direction of Prof. Dr. H. Prinzbach.

In 1978 he joined the group of Prof. Dr. A. Eschenmoser at the ETH Zürich as a postdoctoral fellow until 1980. He returned to Freiburg and became "Dozent" in 1990.



The Reagent:

$P_4$ -t-Bu is a member of a novel class of kinetically highly active uncharged peralkylated polyamino-phosphazene-bases<sup>[1-3]</sup>. Among these  $P_4$ -t-Bu is one of the most hindered and basic, more than 24 pK units stronger than 1,8-bis(dimethylamino) naphthalene or triethylamine and about 18 pK units stronger than DBU. It is thermally stable up to ca. 120°C, inert to dry oxygen and extremely resistant towards (basic) hydrolysis, but very hygroscopic. For practical reasons  $P_4$ -t-Bu is offered as 1.00 M solution in hexane. The very low Lewis-acidity of the huge cation  $P_4$ -t-Bu-H<sup>+</sup> sharply contrasts the characteristics of lithium-bases.

A wide range of otherwise inaccessible "naked" carbanions, e.g. of esters, β-lactones, nitriles, benzothiazole<sup>[2]</sup>, lactones<sup>[4]</sup> or e.g. sulfones<sup>[5]</sup> undergo very rapid alkylations even when quaternary centers are to be formed. The lack of "chelate control" by the phosphazene-cation results in different stereoselectivity compared to metalorganyls. The high steric hindrance of  $P_4$ -t-Bu enables the formation of pure 1-alkenes from primary halides at room temperature in very high yield<sup>[1]</sup>. The salts of the base are easily recoverable after separation from the reaction mixtures by precipitation or filtration over silica or alumina.

References:

[1] R.Schwesinger, H.Schlemper, *Angew.Chem.* **99**, 1212 (1987).  
[2] R.Schwesinger, *Nachr.Chem.Tech. Lab.* **38**, 1214 (1990);  
H.Schlemper, Dissertation Universität Freiburg, 1990.  
[3] R.Schwesinger, *Chimia* **39**, 269 (1985).

[4] T.Pietzonka, D.Seebach, *Chem. Ber.* **124**, 1837 (1990).  
[5] H.-J.Gais, J.Vollhardt, C.Krüger, *Angew.Chem.* **100**, 1108 (1988);  
M.Flötschinger, B.Zipperer, H.Fritz, H.Prinzbach, *Tetrahedron Lett.* **28**, 2517 (1987).

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The Fluka Prize:

Since 1987, the Fluka Prize "Reagent of the Year" has been awarded annually to a research project, in which a new compound has been shown to be a reagent of prime importance, useful in organic chemistry, biochemistry or analytical chemistry.  
The winner will be awarded the sum of sFr. 10 000.-. He will be free of any obligations whatsoever.

Nominations for the Fluka Prize "Reagent of the Year" should be submitted to the Fluka Prize Committee c/o Fluka Chemie AG, CH-9470 Buchs/Switzerland no later than September 30th. Full details regarding the Fluka Prize are available upon request.

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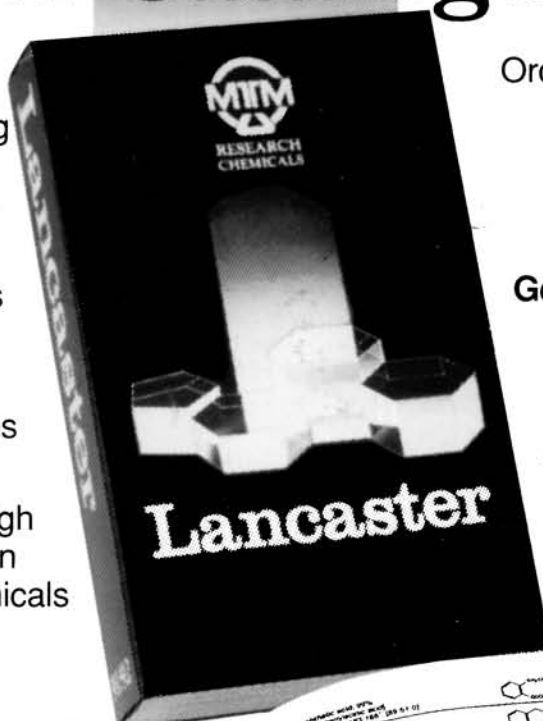
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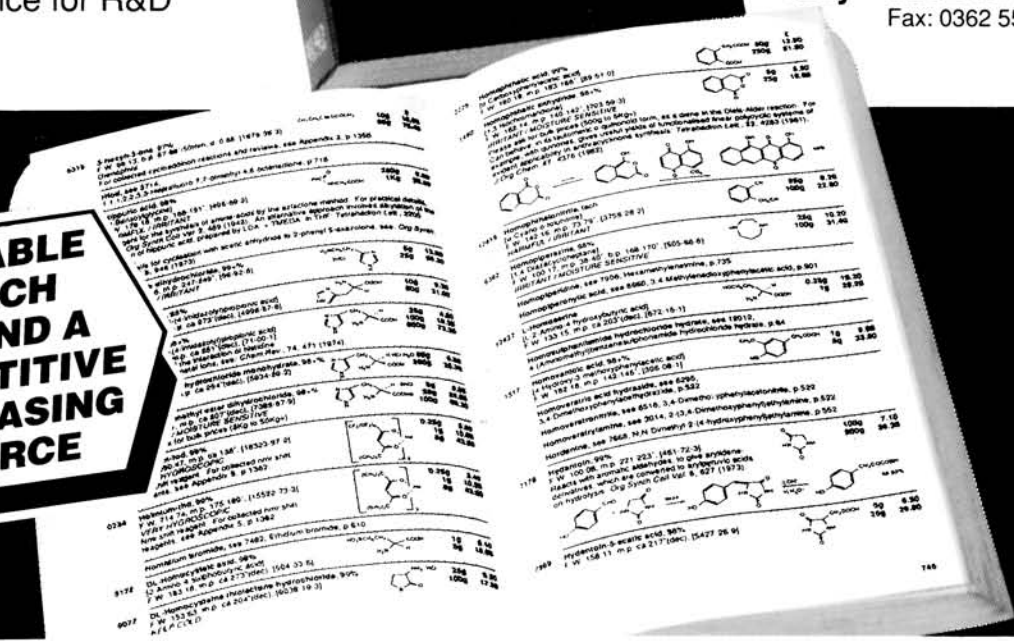
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