

(11) Chlorosarin,  $C_4H_{10}ClO_2P$   
CAS 1445-76-7  
HS 29.31.00

**Synonyms:** O-isopropyl methylphosphonochloridate.

**Physical Properties:** MW: 156.5; Bp: 40°C;  $d_4^{21}$  1.15;  
 $n_D^{23}$  1.4285; liquid for ( $\pm$ ) form  
Rform: liq.;  $[a]_D^{27}$  -52.3°;  $n_D^{25}$  1.4281

Sform: liq;  $[a]_D^{31}$  +52.8°;  $n_D^{25}$  1.4298

**Synthesis:** The reaction of dialkyl methyl phosphonates ( $CH_3.P(O)(OR)_2$  with thionyl chloride, oxalyl chloride or phosgene leads to the formation of alkyl methylphosphonochloridates in high yield; yields for the isopropyl ester are in the 61-45% range (Z. Pelchowicz, J.C.S., 1961, 238; (Coe et. al., J.C.S., 1957, 3604) for resolution see H.S. Aaron et. al., J.A.C.S., 1962, 84, 617.

**Toxicology:**  $LD_{50}$  for the isopropyl ester is 4.5 mg/kg (rat) (Z. Pelchowicz).