

Schedule 1**A. Toxic chemicals:**

(1): O-alkyl ($\leq C_{10}$ incl. cycloalkyl) alkyl(methyl, ethyl, n- and isopropyl)-phosphonofluoridates

It has been estimated that there are 2001 saturated alcohols with up to 10 carbons i.e. if we look at the alkyl radicals that results and the fact that four possible alkyl-phosphorous bonds have been identified, then there would be 8004 possible phosphonofluoridates in this class; this would be a maximum number since there would be a limitation based upon commercial availability of the alcohols. (This calculation is due to CEFIC, Conseil European Des Federations De L'Industrie Chimique.)

There are two weaponized methylphosphonofluoridates. These are Sarin and Soman; GF has been reported to be part of Iraq's stockpile but no technical data is available.

SARIN, $C_4H_{10}FO_2P$
CAS No. 107-44-8
HS No. 29.31.00
Merck 8332

Synonyms: O-isopropyl methylphosphonofluoridate, GB.

Physical properties: MW: 140.11; mp: $-57^{\circ}C$; bp: $147^{\circ}C$; d. 1.10; colourless liquid that is miscible with water (also hydrolyzed by water) and very volatile.

Synthesis: The reaction of isopropyl alcohol (2-propanol) with methylphosphonyl difluoride.

Toxicology: rapidly absorbed through respiratory tract, the onset of symptoms observed from minutes to hours depending on concentration, LC_{50} 0.07 mg/liter, inhalation (humans), casualty dosage (unmasked) 35 mg-min/ m^3 , lethal dosage 100 mg-min/ m^3 . It is toxic by inhalation and absorption (skin and eyes) lethal dose also expressed as 0.01 mg/kg., TPQ 10 (pounds), RQ 1 (pound).

Key precursors: methylphosphonyl difluoride, (CAS. NO. 676-99-3) and methylphosphonyl dichloride, (CAS. NO. 676-97-1) or diisopropyl methylphosphonochloridate.

Precursors: Dimethyl methylphosphonate, $CH_3PO(OCH_3)_2$, (CAS. NO. 765-47-6) or isopropyl methylphosphonate (CAS No. 1445-76-7).

Other chemicals: Trimethylphosphite, (CAS. No. 121-45-9) and Phosphorus Trichloride, (CAS. No. 7719-12-2) or triisopropyl phosphite (CAS. No. 116-17-6).