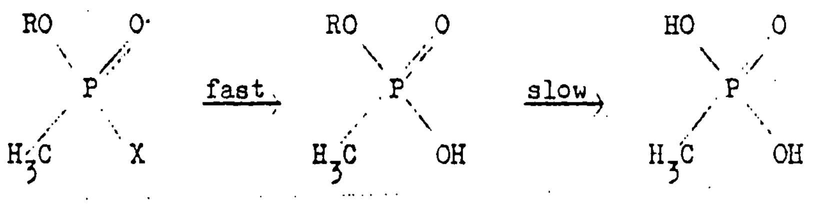
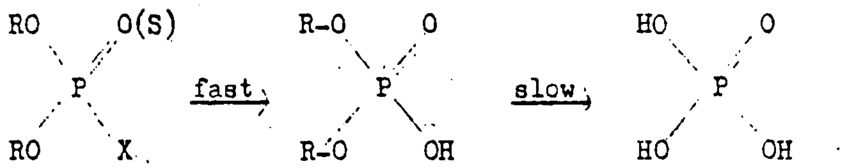
phosphorus-containing nerve agents will present themselves as methylphosphonic acid (equation 1), whereas organophosphorus pesticides will give rise to phosphoric acid (equation 2).



III IV I (1)

Example of III: VX, in which R = C_2H_5 and X = $SCH_2CH_2N(i.C_3H_7)_2$

Sarin, in which R = $i.C_3H_7$ and X = F.



V VI II (2)

Example of V: Parathion, in which R = C_2H_5, and X = $OC_6H_4NO_2$-p and

$P{\cdot}O(S) = P{\cdot}O$

A strong acidic medium is a prerequisite to ensure a complete hydrolysis of both chemical warfare agents and pesticides with chemical formulae represented in equations 1 and 2 respectively. Moreover the process of hydrolysis should take place in a reasonable period of time. In order to establish optimum conditions, hydrolytic data of a number of organophosphorus compounds were collected.

In addition to some hydrolytic half-life values derived from literature a number of model compounds has been selected to determine their rates of hydrolysis. Experiments were carried out in 1 ml sealed glass ampoules containing 0.5 ml of 0.05 M sodium citrate/ citric acid buffer at pH 3. The concentration of the different model compounds was 0.02 M. The ampoules were heated in an oil-bath at 130°C. From the quantitative analysis of the reaction mixture using high-voltage paper electrophoresis, paper chromatography, gas chromatography and ultraviolet spectroscopy the respective hydrolytic half-life values were determined[8]. Table 2 comprises hydrolytic data of a representative of the nerve agents (VX), of some pesticides (Parathion, Disyston and DDVP) and of intermediates that might appear during hydrolysis. To motivate the presence of some of these intermediates it is to be remarked that in the acid hydrolysis of nerve agents (equation 1) and pesticides (equation 2) to I and II respectively, the