8. Samples taken from the interior of reaction vessels

Justification: Detection of traces of former production in case of a recent clean-out and re-start of innocent production.

2.2. Results at measurement points 1 to 4

These results are summarized in figure 9.

While in the atmosphere outside the plant building, only chloro benzene could be detected, parathion-methyl could be clearly identified in the interior plant atmosphere. The detected pesticide concentrations right above the wall surface were considerably higher than approximately one meter away from the reaction vessels.

Conclusions drawn:

1. The equipment at the site was clearly unsuited for nerve gas production in terms of gas-tightness. Air in the interior of the factory was contaminated with the product of the plant and with chemicals used as starting materials.

2. The higher concentration of parathion-methyl at the wall was interpreted as a memory effect. Chemicals present at the site will stay for prolonged periods of time in these structures and will remain detectable with trace analytical methods.

2.3. Measurements at point 5

The results of measurements of samples taken from joint packings are illustrated in figure 10. Air was sucked-off from a joint slit. In a validation experiment, approximately 45 ppb DIMP were added by insertion of a diffusion tube into the gas stream. DIMP was clearly identifiable against a huge excess concentration of chemicals absorbed by the material and released during sampling. This parathion-methyl concentration in turn demonstrated the feasibility of exploiting memory effects in such structures.

As a back-up to these results, laboratory investigations were conducted with the types of packing material actually used in the factory. The test conditions were those described in para 1.2.2. The results are presented in figures 11 and 12. The simulant remained detectable for more than 235 hours from both materials tested. Preliminary laboratory results suggest a much longer residence time of chemicals adsorbed or absorbed by packing materials. Additional tests are still under way.

Based on the experimental data so far available, it seems feasible to combine trace analytical methods for the identification of certain chemicals with visual checks to detect indications of joint packing replacements. Such an