

## Process monitoring

### Monitoring of destruction

There was a general agreement that the destruction process has to be monitored with on-site instruments. This is feasible as inspectors are continuously present and can react to instrument malfunction. Information obtained from the process equipment of the facility can be used for verification purposes. This may be supplemented by the instruments of the Inspectorate. Samples may also be taken for spectrometric analysis on-site. Further development of spectrometric techniques not requiring previous separation of components might be advantageous.

### Monitoring of Production of Schedule 2A and 2B chemicals

Process monitoring in facilities producing precursor chemicals is difficult due to confidentiality reasons and non-presence of inspectors to maintain the instruments.

Verification of non-production could be achieved by monitoring many physical process variables simultaneously, or by incorporating composition indicating instruments in-line with the production equipment. Accurate instruments for measuring physical variables are available, but they may not alone suffice for verification.

Some instrumental developments can be foreseen. Near infrared spectrometry with fibre optics is one possibility but further development is needed. Research is required to record library spectra of all relevant compounds and to create tools for data evaluation. Extensive research is also required to diminish the need for frequent maintenance of the instrument.

Use of continuous sampling equipment and analysis later during on-site inspections is another approach to verification of non-production. The sampling system based on magnetic tape seems promising but requires further research and testing especially of the tamper-resistance and