Is your T-shirt toxic?

Some azo dyes can release carcinogenic amines after reductive cleavage of the azo bond. An example is acid red 114, which, following reduction, breaks down to *o*-tolidine (3,3-dimethylbenzidine). In Germany, these type of azo dyes are banned, and the toxic amines from the degradation products must not exceed 30 mg/kg of textile.

Pakawadee Sutthivaiyakit of the Kasetsart University (Thailand) described an LC/MS/MS method with atmospheric pressure chemical ionization for the quantitative analysis of 20 of these unwanted amines. The research was done at the GSF National Research Center for Environment and Health (Germany) with Stefan Achatz and Antonius Kettrup. Textile sample extracts were reduced with sodium dithionite and cleaned using solid-phase extraction (following an official procedure) or with liquid–liquid extraction, which is a simpler process. One of the goals of method development was to obtain short total analysis times, and, therefore, the LC separation was performed on short columns in an isocratic mode. Peaks do overlap, says Sutthivaiyakit, but multireaction monitoring MS/MS allows selective detection of the compounds.

In quadrupole mass spectrometer 1, a characteristic precursor is selected, then fragmented in quadrupole 2 by collision, and finally, the most abundant fragment is selected by quadrupole 3. This MS approach is limited to eight compounds at a time. Therefore, each sample extract undergoes three consecutive chromatographic runs with different MS conditions. Nevertheless, the total LC/MS/MS analysis time for all three runs is less than 15 min. For example, *o*-tolidine is identified by its retention time of about 4.5 min and characteristic ions at *m/z* 213, which is the precursor $[M+H]^+$ ion, and *m/z* 196, which is the product ion after loss of NH_3. Other toxic amines identified in this manner include benzidine, 2,4-diaminotoluene, 4,49-thiodianiline or 4-chloro-2-methylaniline.

Sutthivaiyakit plans now to establish the procedure at her university. Thailand has a big textile industry, and an efficient control of goods produced for export is of utmost importance.

Academic quality management

Quality managers at a research center or in a university have a harder time than their colleagues in industry. In industry, there are clear guidelines or even government regulations on the analyses of commercial products. But what about analyses that are performed for internal clients or for a research project?

Markus Krapp of the GKSS Research Centre (Germany) has found a way to establish a quality regimen at his institution. Some, but not all, laboratories and several individual procedures of the Centre are accreditated and, thus, monitored by external audits. Others follow Eurachem/Citac guidelines (e.g., "Quality Assurance for Research and Development and Non-Routine Analysis"). These documents are available on an internal, server-based quality information system, which includes listings of relevant Web sites, says Krapp. In addition, staff participate in various training programs, including a special course on quality assurance. The efforts are monitored by interlaboratory tests, internal audits, and quality management reviews. Documentation follows the Eurachem/Citac guidelines, which provides traceability and trackability.

Krapp has introduced other quality management methods at the institution, including blank studies, control charts, intermethod comparisons, and determinations of measurement uncertainties. These types of quality assurance tools are typically unknown in research groups and especially in academia, he says.

The effort could spread. Bernd Neidhart, also of GKSS, wants to establish such techniques widely in universities. Neidhart now chairs the Eurachem Working Group MAFIA, which translates to managing analytics for implementation in academia.

GOVERNMENT AND SOCIETY

NACLA gains momentum

The National Cooperation for Laboratory Accreditation (NACLA) announced at its second annual general meeting in April that efforts to reduce the number of accreditations for U.S. testing and calibration laboratories are well underway. Although participation is still lower than organizers had originally hoped, membership in NACLA reached 100 in January.

Any organization that has an interest in laboratory accreditation in North America can apply for membership in NACLA in one of the following capacities—accreditor, government, laboratory, user of accreditation or laboratory services, or general interest. Membership in NACLA, however, does not guarantee recognition as a NACLA accrediting body. All accreditors will be evaluated according to NACLA recognition procedures.

Thus far, four applications have been received from accrediting bodies, two of which had already undergone evaluations at the time of the meeting, and four more accrediting bodies are working to complete their applications. Recognition of the first group of accrediting bodies is expected this month.

NACLA is a public–private partnership aimed at providing single