Safety and quality of food contact materials. Part 1: Evaluation of analytical strategies to introduce migration testing into good manufacturing practice

The results of a research project (EU AIR Research Programme CT94-1025) aimed to introduce control of migration into good manufacturing practice and into enforcement work are reported. Representative polymer classes were defined on the basis of chemical structure, technological function, migration behaviour and market share. These classes were characterized by analytical methods. Analytical techniques were investigated for identification of potential migrants. High-temperature gas chromatography was shown to be a powerful method and H-1-magnetic resonance provided a convenient fingerprint of plastic materials. Volatile compounds were characterized by headspace techniques, where it was shown to be essential to differentiate volatile compounds desorbed from those generated during the thermal desorption itself. For metal trace analysis, microwave mineralization followed by atomic absorption was employed. These different techniques were introduced into a systematic testing scheme that is envisaged as being suitable both for industrial control and for enforcement laboratories. Guidelines will be proposed in the second part of this paper.