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HS–SPME–GC–MS Analysis of Organic Compounds Emitted from Poly(methyl methacrylate)

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Volatile organic compounds generated during thermal decomposition of poly (methyl methacrylate) (PMMA) were analysed by capillary gas chromatography with mass spectrometry detection (GC–MS). Decomposition process of PMMA was carried out for 10 min in the closed cell at 100, 150, 200, 250, and 280°C. Volatile compounds emitted from poly(methyl methacrylate) were trapped onto the SPME (solid phase microextraction) polymeric fibre and further analysed by GC. Qualitative analysis has shown that the emitted vapours are the complex mixture of decomposition products of poly (methyl methacrylate), *e.g.* methyl methacrylate and several polymer-accompanying compounds as the initiator (2,2'-azobis-(2-methylpropionitrile) – AIBN), chain regulator (dodecanethiol), inhibitor (Topanol OC), and plasticizers (phthalates). Our studies covered identification of the compounds evolved during decomposition of poly(methyl methacrylate) into the headspace phase, optimisation of HS–SPME conditions, *e.g.* fibre coating, desorption time and temperature, as well as of the conditions of PMMA decomposition, *e.g.* decomposition time and temperature, or the sample mass. We accomplished also quantitative analysis of main products of PMMA decomposition and of the accompanying compounds present in the studied material.