

## **Disaster Management Using Mobile Mass Spectrometers**

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Based on the experience of the development of a military CWA-GC/MS, the Bruker Daltonics MM1, further applications for disaster management have been carried out. The successor system, the mobile EM 640, is used by 20 European fire brigades and the German coast guard. This instrument is part of the Analytical Task Force, as well as Gas Detector Arrays and a scanning FTIR spectrometer for passive remote sensing .

Fast and simple sample preparation and introduction into the MS are essential for field work in harsh environments. Seven analytical procedures for samples of air, soil and water containing VOC and SVOC have been established in the fire brigades. All parts for sample preparation which may be contaminated are disposables. The MS is equipped with a DMS tubular membrane inlet at 200°C and it is pumped by an ion getter pump, so longtime stable operation under all circumstances is achieved. Besides in laboratory containers, trucks and helicopters the instruments are installed on the three German marine pollution control vessels mainly for air monitoring.

A special task of the coast guard is discovering chemicals spilled by sunk containers or ships. For this purpose a submersible GC/MS has been developed. This system, working in a depth of up to 300 m, can automatically extract the organic pollutants by a membrane unit. In the first step of the extraction the tubular membrane is kept cold and is thus absorbing organics according to Henry's law. In the second step the membrane is heated up to 200°C. The sampled pollutants are released into the carrier gas flowing through the tubular membrane to the GC. This MI/GC/MI/MS instrument analyzes water samples periodically (3-5 min) down to the ppb level. Results of field measurements are presented.