

Field studies on the OC aerosol grenade

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Abstract

The study on a less hazardous crowd control technology for a riot control purposes was originally requested as executive assistance by the Police Technical Centre. Policemen use nowadays hand-held pepper spray but there is also a need for throw-out type product for these purposes. The Finnish peacekeeping troops also took an interest in the matter.

The proper way of using an OC aerosol grenade were meant to be evaluated by means based on the chemical analysis of spreading tests of the active ingredients in the aerosol cloud. This is due to fact that an overdose concentration of the effective ingredient might be dangerous for a target of use. On the other hand a too low concentration may not be effective enough. Not to mention it is clear that the knowledge of chemical composition is necessary for an assessment of the health effects and the operational safety of the use of the throw-out can.

The effective ingredients in the OC aerosol grenade is oleoresin capsicum extracted from chilli peppers. The active principles of oleoresin capsicum include capsaicin and dihydrocapsaicin. The concentration of these substances in the aerosol cloud was determined at the different weather conditions in the winter as well as in the summertime. Additionally, the aerosol behaviour indoors was mimicked with tests performed in an airtight cargo container.

The qualitative analysis of the compounds were done with FTIR, MS and NMR spectroscopies. The air samples were collected on XAD-resin cartridges with SKC or GilAir constant flow air samplers at distances between 1 to 30 meters from the OC aerosol grenade launching site. The sample preparation and quantitative analysis with GC/MS were carried out in the laboratory. Short clean up and decontamination tests were also done.

Keywords: Oleoresin capsicum, capsaicin, dihydrocapsaicin, riot control