

Complementary Training Method for Mine Detection Dogs

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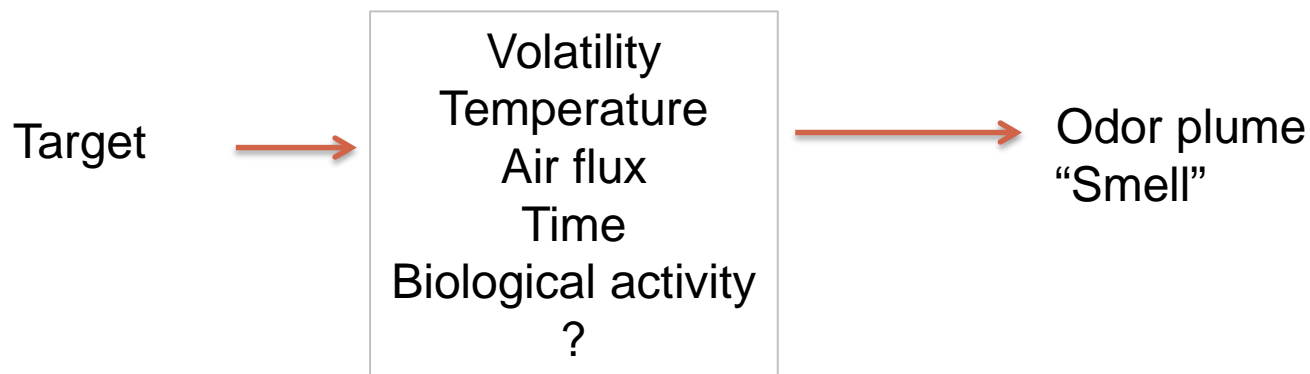
FOI/ Rose-Marie Karlsson, Mona Brantlid, Erik Holmgren



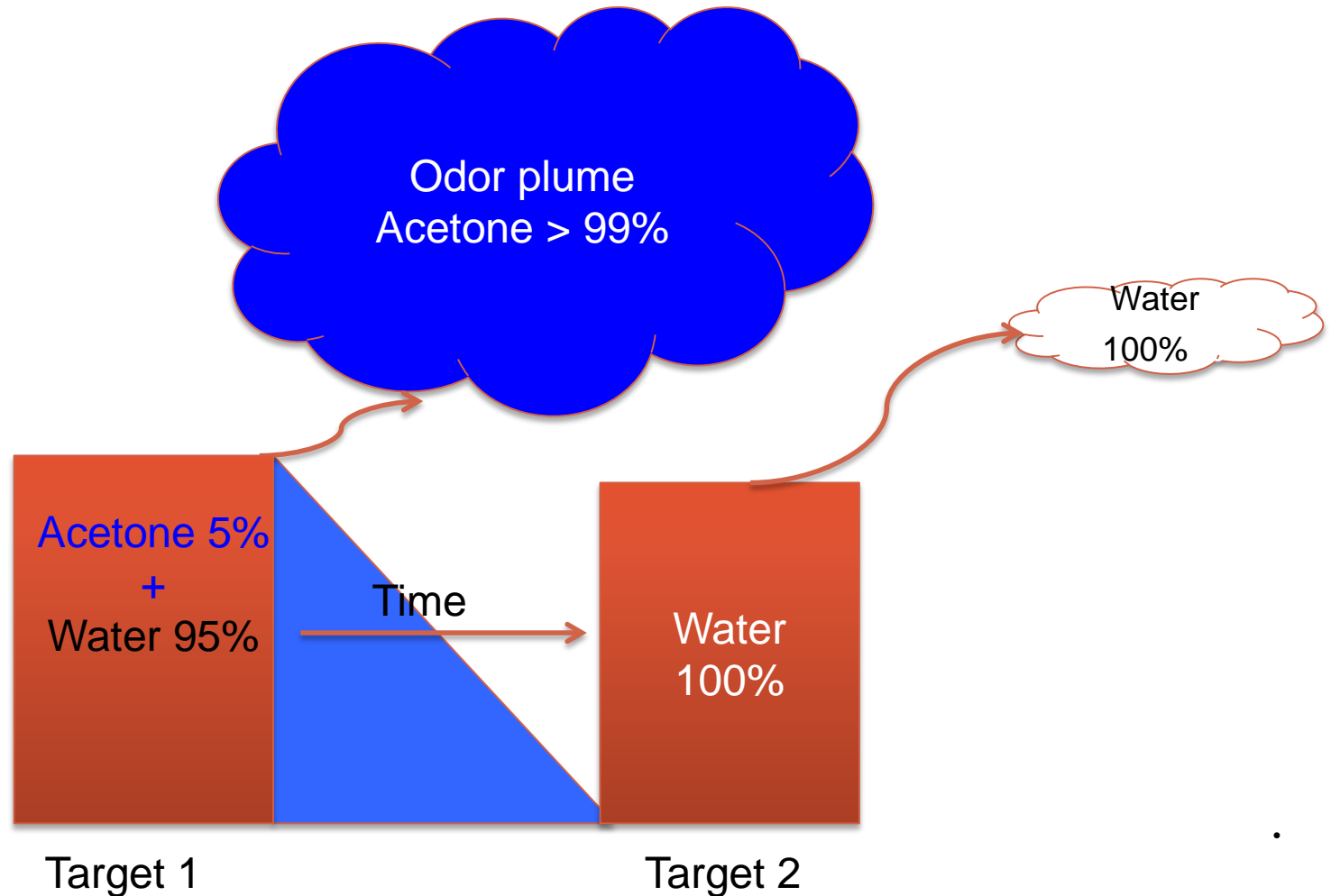
Summary and the full report at **WWW.IWDBA**

Project Financed by Swedish Armed Forces
Performed by FOI; The Swedish Defence Research Agency

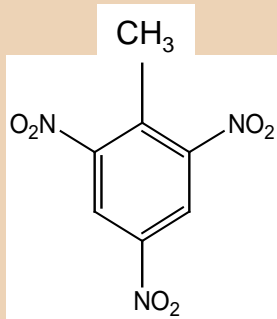
- **Target**; the chemical composition of the actual substance
- **Odor plume**; the chemical composition of the air born information coming from the target



Target composition, time, temperature and odor plume

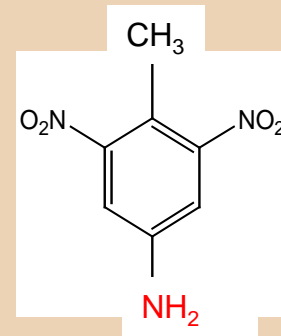


Target and odor plume

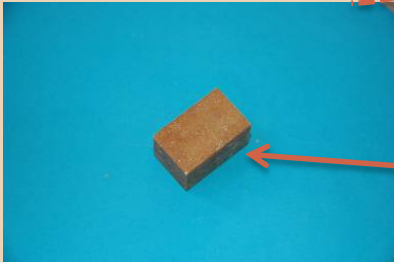


2,4,6 TNT

Odor Plume
Contains 1% TNT
99% DNT and
other compounds



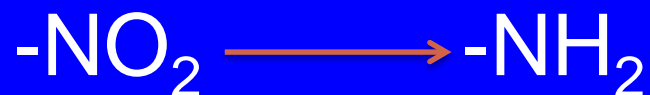
DNT
(4 amino, 2,6 DNT)

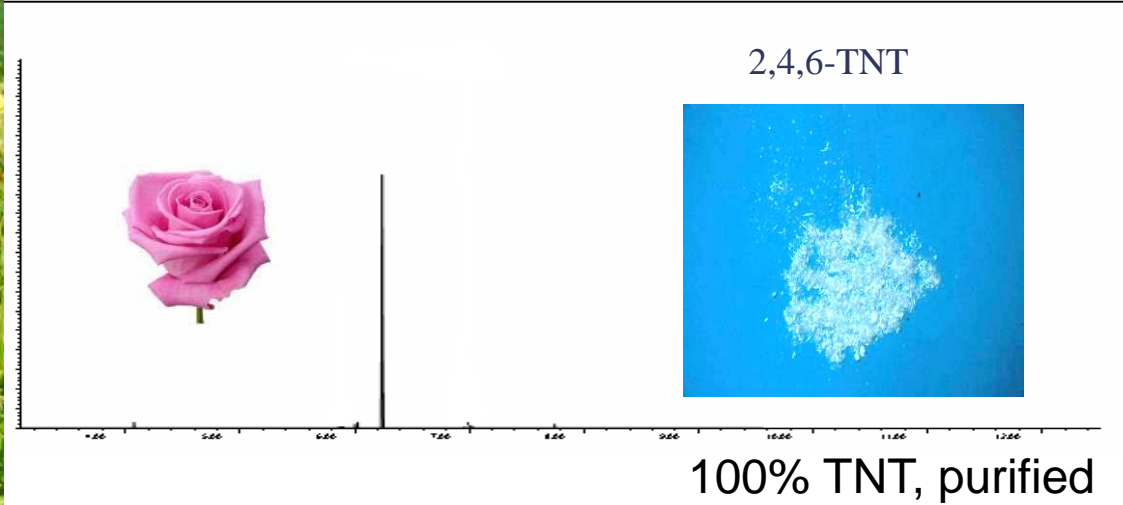
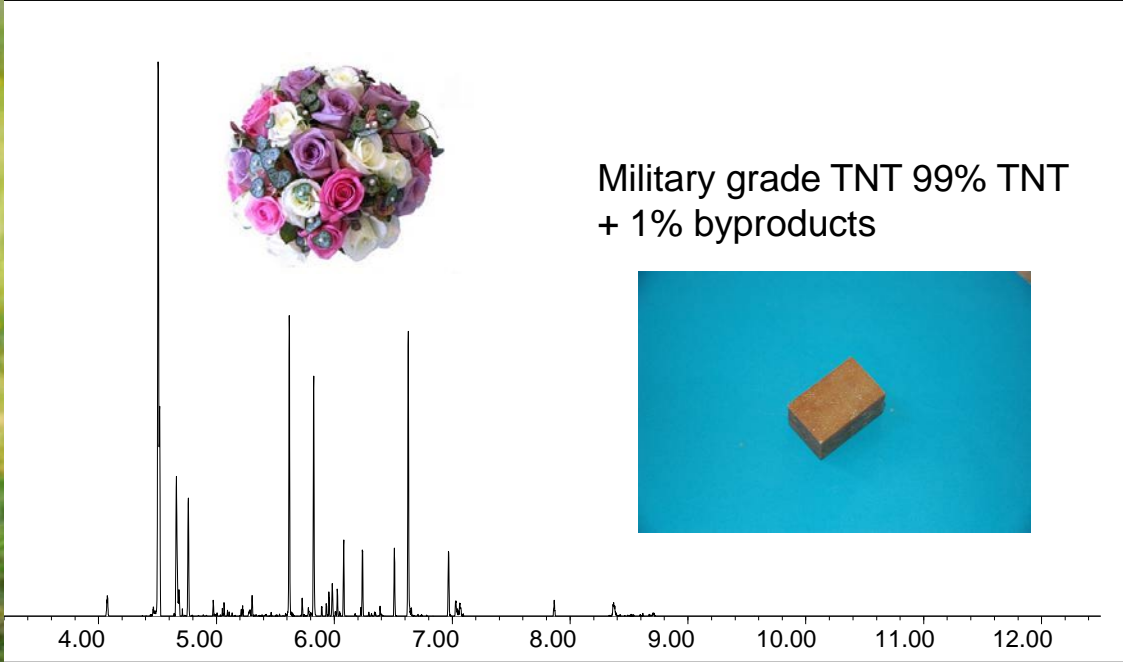


Target; Military grade TNT; 99% TNT, 1% other compounds

The composition of the odor plume depends on.....

- Volatility of the compounds in the target substance
- Temperature
- Humidity
- Time
- Biological activity



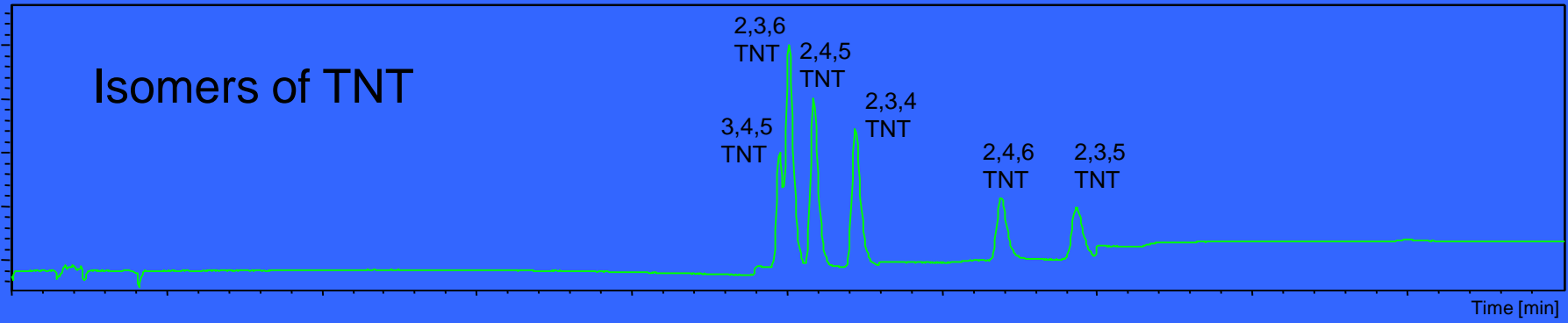
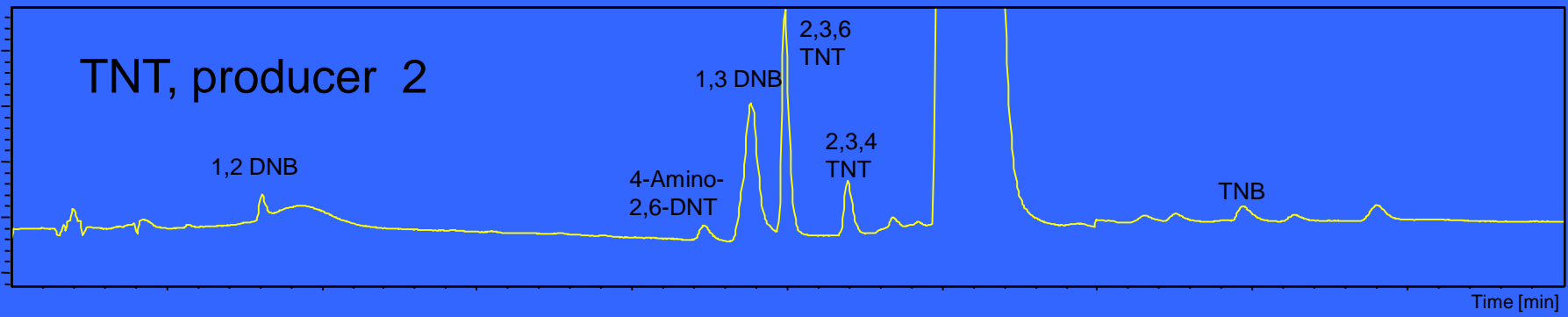
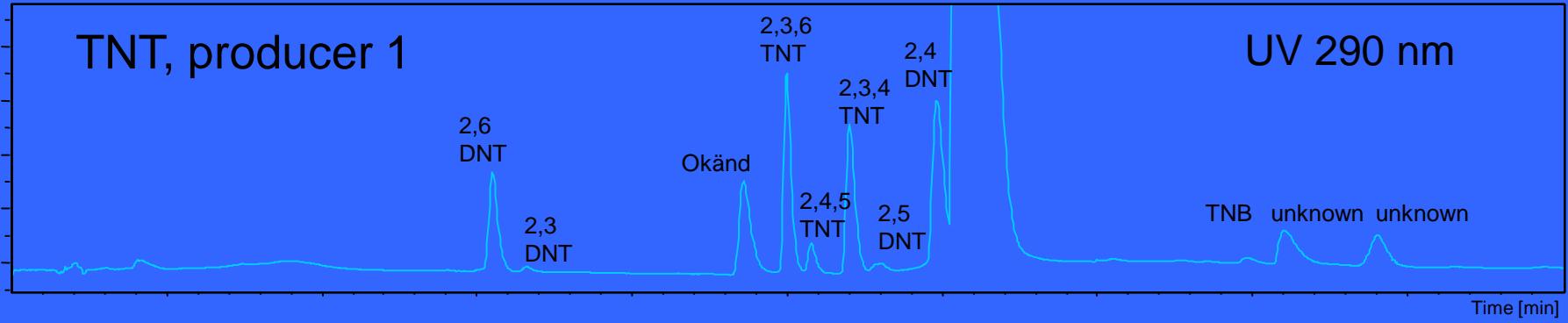


Pure TNT is the lowest common denominator in the gas phase above a mine

The smell of TNT may vary



- ...depending on the manufacturer
- ...over time (many of the contaminants are volatile)
- ...due to the degradation process in the soil
- ...depending on buried depth, soil type, climate, time



DNT is not present in all types of TNT in mines - this is why it is important that the MDD knows the TNT and not only the DNT scent

Consequence...

Training on military grade TNT will make the dog focus on DNT or other pollutions that may vary...however....

...DNT is not present in all types of TNT

Since TNT is present in all odour plumes
train on **purified TNT**



Piece of military grade TNT



Flaked commercial TNT



Purified TNT

In the case no access for purified TNT can be obtained, adding flaked vented TNT to the TNT water solution is an alternative. Vented TNT is produced by crushing a solid piece of TNT and leave it in a dark shaded place (no UV light) so that all volatile components can evaporate from the TNT

Prepare a saturated TNT water solution from purified or vented TNT.

Address the water TNT to the ground using a syringe

Start training and lower concentrations gradually

Advantages

- *Instantly available to the dog - a training site with mines need about 3 months to settle*
- *Not regarded as an explosive and thus easy to handle*
- *Fast and easy way to prepare a training area*
- *No surface disturbance*
- *Less variation in scent – better control*
- *A training area without a need for guards or fences, no security risk*
- *Less toxic to the dog and environment*





Questions...