

The charging wagon, carrying unvapourized organic residues and metal parts, is then moved into the burn-out chamber. Here, the metal parts, e.g. shells, are annealed in air at 1000°C during 12 to 18 hours. The effluent air from this chamber is conducted through the main incineration chamber for final combustion of toxic components.

The charging area and displacement room are adjusted to an underpressure of 0.5 to 1.0 millibar below atmospheric pressure in order to prevent any toxic vapour from escaping to the environment.

4.2 Flue gas scrubbing

Flue gas from chemical agent incineration at first is cooled down to 80°C by injection of water into the cooling tower (quench). In passing two washing towers (scrubbers) arranged one after the other, the noxious gases SO₂ and HCl are eliminated with additional water; by simultaneous injection of sodium hydroxide (NaOH) a defined pH profile is achieved.

As a result of waste water neutralization, sulphur mustard is finally converted into harmless salts. The sodium sulfate and sodium chloride formed can be released into the municipal waste water system.

The scrubbed flue gas leaves the plant via the stack after removal of particulate matter by an aerosol separator. Arsenic trioxide, formed under incineration of materials containing arsenicals, is also removed from the flue gas in this process.

Sampling probes and analyzers for the continuous monitoring of the emissions of SO₂, HCl, hydrocarbons and dust (including traces of arsenic trioxide) are attached to the stack. The emission data are transmitted to recorders installed in the switchboard panel in the central operation control room. All recorded data have been far below the limits set by law for permitted emissions.

4.3 Precipitation of arsenic compounds

Arsenicals or mixtures containing arsenic require as an additional effort the collection of the entire washing water. This aqueous solution of mineralized arsenic(III) compounds is then subjected to oxidation and subsequent arsenic precipitation.

The mineralized arsenic(III) compounds are oxidized by permanganate to form arsenate(V). The addition of ferric chloride leads to a flocculation and dragging effect of the resulting ferric hydroxide, accompanied by the precipitation of ferric arsenate. This sludge-type material is dehydrated by a filtration step and the filter cake filled into plastic bags placed in 200 litre steel barrels.