SORBALIT^{R} - A New Economic Approach For Reducing Mercury and Dioxin Emissions

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The quest to improve the existing state of technology and the widespread dissatisfaction with certain emission levels at solid waste incineration plants is at the root of technical progress. This dissatisfaction is not only expressed in public opinion, but the engineers running the incineration plants also desire reduced emissions.

The main reasons for their dissatisfaction are:

- The higher than desired emission of mercury (this being the index element for toxic heavy metals).
- The higher than desired emission of dioxins and furans (these being the index elements for toxic organic compounds).

The above mentioned dissatisfaction has had several results. On the one hand, administrations all over the world have sought to reduce authorized emission rates by regulations, for example, Germany's 17th Federal Regulation on Emission Protection and the Clean Air Act Amendments of 1990 in the United States.

The objective of the development concept for Sorbalit was to modify the calcium hydroxide previously employed at waste incineration plants in such a manner as to make it suitable as a carrier for absorption materials and in this way to minimize the emissions of exotoxic or ecotoxic substances. This paper has described and presented the initial operating results from various incineration facilities.

When Sorbalit is employed, the following emission values are reliably attained:

- < 0.05 mg Hg/Nm^3 for mercury at 11 % O_2
- < 0.1 ng TEQ/Nm^3 for dioxins and furans at 11 % O_2
- Below the detectable limit for PCBs
- Below the emission limit for PAHC

Furthermore, the use of Sorbalit in waste incineration processes entails considerable advantages with regard to the process engineering involved. Tried and tested facilities which are already available, from the supply silo through conveyance and dosing equipment to the mixing lines, filters, and flow controllers, all remain in use.

The use of fabric filters is particularly effective. Residual dust levels of < 10 mg/Nm^3 (0.004 grs/scf) at 11 % O_2 can be attained, and values of 1 mg/Nm^3 (0.004 grs/scf) are quite realistic.

This good separating capacity is also of importance with regard to the use of Sorbalit, as it means that Sorbalit, to which the separation pollutants are attached, is not emitted.

The flow treatment process, that is, the injection of Sorbalit into the flue gas flow, followed by vortexing of the flow and subsequent separation on the fabric filter, can be installed as a "Sorbalit stage" down stream of any incineration plant.

This is, therefore, a universally applicable process. Consequently, numerous areas of application are envisioned for Sorbalit in the field of flue gas purification, some of which have already been put into practice.

The Sorbalit stage for separating volatile inorganic and organic substances can be integrated into the flue gas cleaning systems of the most diverse processes:

- waste incineration plants
- sewage/sludge incineration plants
- large scale furnaces
- power stations
- furnaces in the glass manufacturing and ceramic industries
- wood drying plants
- steel mills
- aluminium melting plants (primary and secondary)